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Micros shine through at Wescon

EVEN though it was an exhibition dedicated to electronic components, this year's Wescon Show in Los Angeles, California, could not avoid the fact that the "star" component, the microprocessor, is as much an integrated system as anything else.

In fact the centre of the exhibition floor was given over to a display of a dozen intriguing applications of the device, that ranged from a polling system for business meetings, to an automated robot mail delivery system, called mailmobile.

The polling system, known as Consensor, has been developed by Applied Futures Inc, of Greenwich, Connecticutt and is already being used by AT&T, IBM and Xerox in business meetings. It consists of a processor, TV, and up to 100 hand terminals, the latter being used by individuals at the meeting to register their preference on up to 10 options on a particular decision or plan of action.

To the selected option, the individual can also add a percentage "weighting factor" to display the degree of confidence placed in that selection. The results are displayed graphically as a histogram on the TV.

The system is said to halve the time spent on the decision making process, and a key element in this is perhaps the data that appears in the top right-hand corner of the display. Here, the system shows a real time calculation of the cost of each meeting.

The Mailmobile has been produced by Lear Siegler, and is vaguely reminiscent of an elongated Dalek with a paper fetish.

Many people at the exhibition tried to outsmart the sensors in head-on confrontations, and always lost out. They were, however, liable to be cut down by the robot as it made sharp turns. It seemed a little unsure as to what was beside it.

In addition to these esoteric applications, there were several microcomputer systems on display, with manufacturers as interested in obtaining foreign distributors as home customers.

One such was a Swedish system, known as LYS-16, produced by a company called ATEW. Based on a National Semiconductor IMP-16 microcomputer system, it can have a maximum read write memory of 128K bytes, and can be equipped with floppy disc, printer and cassette interfaces.

It comes complete with an Ascii keyboard and display terminal. There is a wide range of software packages available, including Basic, extended Basic, its own version of PL/1, plus a wide range of utilities.

One system on show that will soon be available in the UK is the Outpost II from the Tano Corporation. Being handled in this country by Warren-Woodfield Associates, MP Kenneth Warren's company, it features Ascii keyboard, 24x80 character CRT and a Motorola 6800 CPU.

NEWS IN BRIEF

Ford picks Amdahl V/5

THE second order for Amdahl from the UK motor industry has come from Ford, which is to replace a 370/158 at its Warley, Essex computer centre with an Amdahl 470V/5.

Chrysler UK installed a V/6-II earlier in the summer and also has Amdahl machines in France and the US, while Ford runs a 470 in the Detroit area. Ford of West Germany is understood to be considering an Amdahl machine. British Airways is expected to place an order soon for four Amdahl systems with two of the largest machines, the V/7S (CW, September 14).

NCR redundancies

MODERNISATION of the product range has caused NCR to make 30 of its 64 NCR 299 programming team redundant. The remaining 34 female programmers have been retrained for work on the company's 8000 family of systems.

The redundancies will take effect from the end of October.

Dataplex bought

ALL assets of the bankrupt word processing firm Dataplex (CW, June 5) have been acquired by BDP Word Processing of Isleworth, according to a letter sent to Dataplex customers by the official receiver.

Still in court

AT the time of going to press, the injunction being sought by Mostek against Inmos was still being argued in court, a full week after the hearing started. A spokesperson from Mostek in Carrollton, Texas, said however that the hearing should be completed "sometime this week, we hope."

Former bus boss is named as head of NRDC

Sir Frederick Wood

A NEW chairman of the National Research Development Corporation is Sir Frederick Wood, the former boss of the National Bus Company. He succeeds Lord Schon who has held the post for the last 10 years.

In its annual report published this week, the NRDC announced a moderate increase in income over last year but a substantial rise in the amount of money invested in new projects: £6 million, 37% up on last year's £4.38 million. The corporation gets its income from licence fees for inventions financed in the past, and its continuing profit is enabling it to repay loans from the Department of Industry.

Computer projects are forming an increasing part of the NRDC's investment. Support has also been given to Compeda Ltd for engineering design software coming from universities and research centres.

Use of MVS 'could double by 1980'

USAGE of MVS and VM/370 could double in the next fifteen months, according to a US survey of large-scale IBM business users. The survey projects a simultaneous drop in the use of SVS, DOS/VS, and non-VS operating systems, according to the US publication Electronic News.

The study, conducted by the business users group, Guide, also found that nearly a quarter of Guide members saw current IBM database products as unsuitable for future long-term needs.

Guide's questionnaire, an annual survey, was this year answered by 1,020 members. Of these, 330 reported using MVS at the start of the year, while 607 expected to be using it by the end of 1979.

For VM/370, the corresponding figures were 85 and 157.

Of DOS/VS users, numbering 381 at the start of the year, only 237 saw themselves using the system by the start of 1980.

The trend to MVS, giving it nearly 50% of the sample group by the end of this year, and over 60% by the end of next, is attributed chiefly to the need to take advantage of the MVS and VM/370-only features of the 303X processors.

Industry opinion that MVS will eventually be the only system supported may also be a factor.

The survey reveals only a slight growth in the number using DBMS software, though around 78% can be expected to be using database products within the next few years. Current installations number 595, having dropped from 578 in 1975 to 562 in 1977.

Seventy-three users plan to install DBMS in the next year, according to the survey, and a further 131 plan to install one subsequently.

IMS, however, has found little favour, with the number of users falling from 426 to 325 in the last year. The survey also notes that some 95 sites have considered and rejected IMS within the last year.

● Another forecast that IBM will concentrate all future efforts on MVS-based systems was made last week at the Infotech conference "IBM: the next five years," see page 11.

City shows increasing interest in service firms

INCREASING interest by City investors in the computer services industry is pointed up by a report prepared by stockbrokers Greene and Co entitled "Investment in computer services 1978."

The report outlines the major changes taking place in the computer industry, gives financial figures on turnover, price/earnings ratio and so forth on 50 UK bureaux and software houses, and makes recommendations for investment.

Two companies, ICL and AGB Research, are specifically recommended for investment, ICL because of its healthy share price and AGB for the overall prospects for the consultancy field. Regarding ICL's share price, which was until recently undervalued, the report says: "It is our belief that there is still further scope for capital appreciation."

The report points up AGB Research's computer knowhow and its diversification into industrial market research.

In the services industry as a whole, this is reflected in a swing of numbers of staff employed out of data preparation and control into consultancy, programming and analysis, and selling. Growth of leasing has also resulted in investment being diverted out of manufacturing into services.

NEB stake in Logica welcomed but . . .

WHILE welcoming the move by the National Enterprise Board in wanting to take a shareholding in software and systems consultancy Logica, the AUEW-Tass committee representing staff members in the company has requested more information regarding possible changes in the shareholding and the apportioning of controlling power.

The questions were formulated during a Tass membership meeting held at the beginning of September, and they seek to discover who the external European shareholders will be who in Logica will own shares, the exact nature of the various shareholdings in terms of votes/earning stock; and finally how the board of directors will be structured and what powers individuals will have.

In announcing that the questions had been asked, Tass said that "to date there has been no reply" from Logica management.

"We are still hoping for a reply," said a Tass joint committee spokesman "We won't expect one. If there is no reply we will have to go back to the members and discuss what to do next."

Commenting on the Tass announcement, Len Taylor, Logica's managing director said: "Logica does not effect its communications with staff and clients through the offices of Tass. The staff know that and the press knows that."

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Briefing

Fury over South African 2960s

TWO ICL 2960s have been delivered to the South African Police "in the last few weeks". As a result, a meeting is to be held betw[illegible], and manage[illegible] which the u[illegible] ress their oppos[illegible] to South African [illegible] forces. The issue [illegible] raised at the Labour [illegible] conference next week.

Earlier reports indicated that ICL had sold the South African Police a 2972 (CW, August 31) but ICL confirmed that the 1960s had been delivered to its South African subsidiary for installation at the police.

Inmos victory

THE NEB's Inmos subsidiary has won its court battle in Dallas, Texas with Mostek. Judge Robert Porter refused to grant Mostek a temporary injunction aimed at stopping Inmos using Mostek's trade secrets. Mostek was concerned because former workers, led by Paul Schroeder, had joined Inmos. The Judge said he would not stop Inmos competing with Mostek "on the basis of mere speculation or apprehension".

Rejection denied

RUMOURS in the industry that the working party report on the social and economic implications of the microprocessor, from the Advisory Council for Applied Research and Development (Acard) has been rejected by the Cabinet, have been firmly denied by 10 Downing Street. The Cabinet Office said that no draft of the report of the working party had yet been produced.

Radio job spots

THE Computer Weekly job spots on Capital Radio begin next week. See page 27.

Stars on Saturday

IT'S the big day on Saturday, September 30, for the computer athletes who will be coming from all over the country to take part in the first Computastars championships at London's Crystal Palace. The programme starts at 11 am so why not come along and cheer on the contestants and have a good day out as well? Tickets can be had at the gates, 60p for adults and 30p for children.

In hospital

FOUNDER of UK microcomputer manufacturer Bywood Electronics, John Miller Kirkpatrick, was taken to hospital last Thursday, two days before he was due to speak at the Personal Computer World Conference. At the time of going to press, he was undergoing tests. Bywood itself is still seeking a suitable takeover bid, while operating under a creditors' moratorium.

CSA queries Queen's Award ban on software

COMPUTER software is not eligible for the Queen's Award to Industry because it is not "high technology". That is the reply a UK software house received when it applied for an award for its teleprocessing package and, as a result, the Computing Services Association is writing to the Queen's Award Office to ask it to reconsider this policy.

When asked about this, the Queen's Awards Office confirmed that software is not considered to be "within the criteria of the award scheme" for technology but, according to the spokesman, no more light could be shed on the reasoning behind this ruling. The decision was reached by a committee some time ago and "considerable research" would be needed to find out the thinking behind it.

Alan Benjamin, director-general of the CSA, said that it appeared that no-one on the awards committee really knew what software was. He is writing to the Office pointing out that there is a £120 million a year industry in the UK producing software, some of it very advanced. He also is suggesting that services such as consultancy and system design should be eligible.

Lord Peart for BCS conference

KEYNOTE speaker at BCS 70, the British Computer Society's conference next January, will be Lord Peart, Lord Privy Seal. The conference will have the theme "Living with computing", and Lord Peart will address this subject when he opens the proceedings on the morning of January 4.

The conference is a showcase for the Society's specialist groups (CW, July 20). It will include the Annual BCS Lecture, to be given on the evening of January 4 by Professor Murray Laver on the subject "The significance of computing".

Lord Peart is chairman of Acard, one of whose working parties reported last week on the importance of microelectronics to the UK economy, a study which had been instituted by the Prime Minister.

Full details of the conference can be obtained from the BCS at 13 Mansfield Street, London W1.

Syfa for Tesco SNA network

By Keith Jones

A LACK of adequate support for IBM's Systems Network Architecture on the IBM Series 1 minicomputer has caused Tesco to choose the Computer Automation Syfa as the system to equip seven of its big grocery warehouses.

The Syfas will work interactively with an IBM 3032 at Tesco's Cheshunt, Herts, headquarters as one of the first stages of a massive SNA network being set up by Tesco over the next ten years.

Barry Grange, Tesco's computer director, said that the IBM 3790 was seriously considered for the warehouses because of the SNA support it provides, but that the local processing power of the 3790 was not nearly great enough for the job. Each of the Syfa systems being installed will have at least 150 Megabytes of disc storage and at least eight interactive video terminals. Several will be much bigger.

IBM's Data Processing Division salesman brought in a General Systems Division man to discuss the feasibility of using Series 1 based systems as more powerful alternatives to the 3790s. But Series 1 was rejected because of the lack of suitable SNA software.

Series 1 is supported as a cluster controller under RPS version 4 which offers the same SNA data flow control level interface as version 6 of the 3790 SNA support.

A more powerful replacement for the 3790, codenamed Orbit, is expected to be announced shortly by IBM but Tesco says that IBM made no mention of any such system when it bid for the warehouse contract.

Computer Automation announced that it was introducing an IBM 3790 emulation package for Syfa a few weeks ago (CW, August 24).

The Syfa systems at each warehouse will maintain a large stock file which will be continuously updated online with goods inwards information. Retail store order data will be transmitted to the Syfa from the 3032 at Cheshunt and will be used by the Syfa to generate picking lists of goods that are available and also to print invoices for the retail stores involved.

The SNA network planned by Tesco will eventually take in all the company's supermarkets, when they are equipped with point of sale systems.

MoD 'one standard' moves

THE Ministry of Defence has produced a consultative document for the UK computer industry that aims to establish one or two standard architectures for real time computer systems in defence applications.

To date, the MoD's standardisation efforts have been directed towards software, firstly with Coral 66, and later with the Mascot real time executive. These have been intended to give the MoD some measure of machine independence.

A meeting has been set with representatives of the industry for early November, at which the document on hardware will be discussed.

In particular, the document is considering standardising on the order codes of the Ferranti Argus 700 machine, and the GEC 4000 series. A military version of Argus designed to connect to the MoD standard bus was introduced at the Farnborough aerospace exhibition (CW, September 7).

It is possible that one of these will be selected as the standard, although some industry sources suggest that both will be chosen.

Shortage of trained staff could halt government projects—warning

UNLESS there is an immediate increase in the allowances paid to Civil Service computer staff, major government computer projects could be halted due to lack of trained personnel.

This was the warning given by Campbell Christie, deputy general secretary of the Society of Civil and Public Servants last week when he gave details of his union's latest pay claim.

Christie also highlighted a plan by his union to push for the setting up of a "trouble-shooting" team of computer personnel within the Central Computer Agency to provide an internal government consultancy capability. In this way, said Christie, a pool of expertise could be built up and staff morale raised.

The SCPS, which represents 8,000 programmers, systems analysts and operations supervisors, has asked for increases of up to £400 in some cases, and the extension of allowance payments to all staff in data processing positions at executive officer and higher executive officer levels.

Present allowances are £150 for programmers with one year's experience, £300 for two years and £600 after three years or more service. The SCPS claim seeks to increase these to £250, £500, and £1,000 respectively.

Although a spokesman for the CCA said that it had not received details of the proposal to set up a team of computer project trouble-shooters, he did

● Turn to page 4

Call for UK teletext thrust

INDUSTRY Minister Alan Williams has criticised the UK television industry for failing to capitalise on teletext. Speaking last week at an exhibition which signified the start of a national teletext week, Williams called on UK set-makers, broadcasters and component manufacturers to unite now to conquer an estimated world market of 8 million teletext sets.

A spokesman for the British Radio Equipment Manufacturers agreed that more had to be done by the industry, and said that the teletext week and increased publicity from broadcasters was the start of a new drive.

COMPUTER WEEKLY'S INSIDE NEWS

ANALYSING THE DATA

The correct analysis of surveys is important if the data collected by such means is to be of any use. Considerable time and money has been expended on the development of packages that can handle such analyses and in this week's special section Beverly Rowe and John Hall have compiled a list of these packages with details of their characteristics and comments on their capability. Pages 13/15

JOBS FOR DISABLED

What chance have the disabled of a career in the computer industry? With the chronic shortage of staff it would seem that the opportunities are good, but many employers do not know there are disabled people trained in various computer disciplines; others have never considered using such personnel. Now, however, the BCS has completed its survey of possible employers and their names and requirements are stored on the CRC bureau machine. Steve Shirley, of the BCS Specialist Group for the Disabled, describes how the project has developed. Page 4

ALSO . .

Computerview on awareness . . . 2
Focus . . . 2
Facsimile progress in France . . . 3
Jobs for the disabled . . . 4
Downtime by Chad . . . 4
CMG's £8.8m turnover . . . 6
Michie's Privateview . . . 6
Programmer Notes . . . 6
Software File . . . 6/7
Puzzler . . . 7
Sporck on garbage . . . 8
People in the News . . . 10
Diary Dates . . . 10
Op Spot . . . 12
Survey Analysis Packages . . . 13/15
Micro News . . . 16
Wescon Report . . . 17
Sales Bit . . . 53
Hex Kid . . . 55
Personal Computing Show . . . 56

APPOINTMENTS: PAGES 21-55

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COMPUTERVIEW

Govt should start campaign rolling

LAST week's report by the Advisory Council for Advanced Research and Development on the application of semiconductor technology made the now familiar noises on the failure of British industry to capitalise on the "micro revolution." But its most crucial recommendations were not the ones about more money being invested in the semiconductor industry, but that all government agencies involved in education and training should take urgent action to improve education schemes in schools, further education and at work for teaching about the nature and impact of the new technologies (CW, September 21).

The computing service industry, for example, is growing currently at a rate of over 20% because of the increased use of computers. And the microprocessor, by introducing the new technologies and calling into question some traditional computing methods, is adding further to the demands on obtaining increasingly rare skilled staff. Yet the educational and training process, both public and private, has failed to satisfy the current demand.

As the ACARD report also points out, the educational need is not just in training people to become good information technologists but also to increase awareness of the technology's potential at all levels of society.

The main limits to growth are now the availability of enough people to carry out the tasks that need to be done and enough people who understand the technological potential and who can turn it into worldwide marketable products.

And looking at the social impact of a possible increase in unemployment and changes in work and life styles caused by the technology, education and training once again stands at the heart of any constructive solutions.

What is needed is education in making everyone as familiar with information technology as they are with reading, writing and arithmetic; training and retraining to teach new skills; and increased long-term education to provide people with a fulfilling life in the "leisure society," if that ever comes about.

In our interview with education minister Shirley Williams (CW, March 9), she said the government was placing computing as a secondary issue behind improving the three Rs. Shirley Williams clearly linked computing and information technology with maths.

But all the public hoo-hah that has broken during the past six months over the claimed link between micros and unemployment seems to have sharpened the government's thinking.

It is encouraging, for example, that the government responded to the ACARD recommendation on education and training quickly and positively, saying that the relevant government agencies have been asked to draw up plans quickly. The time scales for any innovations filtering through the educational system are far too long.

The government should therefore establish, as quickly as possible, an action plan for a massive public campaign to increase awareness of the nature of information technology. Such a campaign could be started quickly using organisations such as the Open University, the mass media, the trade union movement and computing bodies like the National Computing Centre, British Computer Society and Computing Services Association.

The aim of the awareness campaign should be to explain to everyone the potential of the technology in simple, understandable terms and to give everyone a basis for examining in a coherent, rational way the complex issues raised by the technology so that actions can be taken to avoid some of the pessimistic predictions for the future being fulfilled.

FOCUS

THE Computer Weekly resident defender of the operator, Bernard Allen, recently asked in his Op Spot page, "How did you find your first job?" (CW, September 7). For DP management, the question is more likely to be "How did your first job find you?"

Focus has met few DPMs who are in their job by design. Most have blundered, stumbled or otherwise arrived in the DP hot seat by some mischance or mishap. Fate, it seems, plays a large part in producing DP managers.

Many DPMs have of course grown up with their installation, having passed through Kindergarden — NCR Accounting machines; Junior — visible record computing; Primary — ICT tabulator systems; and Senior — IBM 360 series. Progress beyond this point, however, requires more than luck, stamina and friends in the company corridors of power. Advanced level computing, which involves real time, online and probably interfacing with PCM and OEM and close encounters with satellites and microwaves, requires management skills of the exceptional kind.

It is also probable that the super DP managers would not only have shunned academic achievement, they would without doubt fluff any current computer industry exam. Not that many — if any — DPMs could be persuaded to involve themselves in exams, especially those exams which aim to produce qualified management.

No exam can hope to evaluate the qualities needed for computer management. Such tests are increasingly becoming an outdated irrelevance to the DP industry.

A practical list of exam questions would include:

- Which takes priority: a phone call from the company accountant or the installation engineer?
- If a job run takes three operators three hours on a Honeywell 2050 (lineprinter 700 wpm), how long would the same job take four operators using two V77 minis (LP 650 wpm)?
- A rush job has to be tackled. Should the DPM roll up his sleeves and help man the CPU, or relax and telephone the local bureau?

Exams may well sort out the programmer sheep from the analyst goats. But they will not determine whether any individual will make a suitable DP manager. The skills and abilities of computer management cannot be learnt at the local poly or night school. How then, does the DP manager get his job?

Having friends in the right company places is no longer the gateway to the computer suite. Few company executives would risk their own future — or that of a colleague — by taking over the responsibilities of the DP operation. Neither is being well placed in the manufacturer's sales team a passport to installation power.

The most common route to the top is of course by a prompt response to advertisements. With or without the assistance of a recruitment company, all that is needed, apart from the latest edition of Computer Weekly, is confidence. Plus an ability to convince the company personnel officer that you are familiar with (a) company procedures and (b) the existing or proposed computer procedure.

From a dedicated study of company executives it is rare to find any executive who knows his silicon valley from the local micro chip shop.

Many routes to the top are paved with surprise, coincidence or plain good fortune.

One factor, however, DP managers share with operators is that few newly appointed recruits know what is in store for them. If they did, many vacancies would remain unfilled.

benson ...
drawing ahead of the others

Ten years ago...

COMPUTER WEEKLY SEPTEMBER 26, 1968

MEMBERSHIP of the BCS jumped by 10,000 to 18,600 in its 11th year, which had seen the introduction of professional status and recognised examinations . . . The first CII computer to be designed and built in France, the Iris 50, was announced and was shown at Sicob . . . ICL set up a new office in Paris to strengthen a bid for the French market . . . Sussex police were using a remote teletype terminal link for admin work . . . IBM introduced the 1288 optical page reader . . . Sussex University received a £48,000 SRC grant to study pattern recognition.

Tory MP fears effects of 3 million jobless

LARGE-SCALE unemployment produced by new technology could alienate many young people, turning them against our democratic society and leading to a "potentially revolutionary situation", according to Wallasey's Tory MP, Mrs Lynda Chalker. Steps needed to be taken now to adjust everyone to a world where many did not work, and too few people were yet thinking about the problem, she added.

Speaking to the Liverpool Economic and Statistical Society, Mrs Chalker forecast that by 1990 there would be a steady three million people out of work, even without any radical new technologies coming along, and that people are not being prepared to cope with this.

There would still be many useful jobs to be done, such as caring for th[illegible] but at present these [illegible] viewed by most people [illegible] ways of spending their lives.

The organisation of society would have to move more towards community work, she said, with some way in which people could be paid to do it, full or part time. [illegible] would be particularly important as the numbers [illegible] were exploding.

Language designer

PRINCIPAL designer of the real time language RTL/2, John Barnes, is to join the staff of SPL's new research centre in Abingdon, Oxford, this week. He will work in the general area of language products, including RTL/2, Pascal and the DoD's real time language to the Steelman specification.

INTERRUPT

THE George II Plus operating system supplied by ICL Dataskil has several useful features. For example, if a program cannot open its output file because it is already being written to, the system will suspend the job until the file becomes available. Also if a program asks for, say, LIVEDATAFILE as unit DA1, you can instruct the system to give it TESTDATAFILE instead.

In isolation, these features are excellent. But one day a program was developed to produce two output files. One, FILEA, was on mag tape and defined to the program as unit MT1. The other, on direct access, could be either of two different files depending on the type of run — FILEB, defined as unit DA1, or FILEC, defined as unit DA2.

Eventually, the suite the program belonged to was redesigned. FILEC was abolished and the program was required to update FILEB on every run. There was no need to amend the program, so the systems programmer simply added one more line to the operating system macro so that whenever the program tried to open unit DA2 it was given FILEB, regardless of what name it asked for.

Some time later, an applications programmer was amending the program for an entirely different purpose. At that time core store was at a premium in the installation, so he took the opportunity to shorten the program by removing the references to FILEC. The program would now ask for FILEB as unit DA1 on every run. There was no point in amending the macro as well, since the program would now ask for unit [illegible].

Once more time passed, and once more the program suite was redesigned. This time it was decided to transfer FILEA from mag tape to direct access. The task was given to another applications programmer, who knew nothing about the previous amendment. Unit DA2 was not in use, so he used that for FILEA.

You can guess the rest. On test, not using the production macro, everything was fine. On the first live run the program asked for FILEA as unit DA2. The operating system gave it FILEB. It then asked for FILEB as unit DA1. Since that was already being written to, the operating system suspended the job and settled down to wait until it became available.

And waited, and waited, and waited...

The moral: Always let your systems know what your applications are doing.

● From David Mylward, of Serial UK, who wins this week's £5 Interrupt prize.

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DoE to report on evaluating database software

A COMPREHENSIVE set of techniques for evaluating database software will be a major component of a report being prepared by BIS Applied Systems for the Department of the Environment.

The report, to be published early next year, is the outcome of a two-phase study commissioned from the firm two years ago (CW, May 6, 1976).

While the first phase was restricted to an analysis of local authority database needs, the second phase, currently being completed, addresses the general problem of evaluating alternative database systems. Its results, therefore, are likely to be of relevance to any user selecting database software.

The report will cover four categories of software: DBMS; data dictionary systems; report generators and inquiry facilities; and teleprocessing monitors used in conjunction with DBMS.

In each category, the report will illustrate the application of evaluation techniques with reference to particular software products. However the judicious selection of examples will make it impossible to identify a "best buy" in any of the categories.

A "Which"-type survey would be of much less value, it is argued, as packages can only be evaluated in the context of user needs. Further, the continued utility of the report precludes tying it to current software.

The principal techniques to be covered include the evaluation of documentation; theoretical and physical benchmarking; and methods of analysing other local authorities' experience.

Funded by the DoE's Local Government Information Systems project, the work may be published as a DoE research report but will in any case be publicly available.

'Practical benefit' of CSA membership

MEMBERSHIP of the Computing Services Association is now regarded as being of clear practical benefit, which has led to membership growing to 155, with a target of 180 by the end of 1979, according to the association's new president.

OCKENDEN . . . "companies can see real benefits of membership."

Speaking shortly after his election, John Ockenden, managing director of Scicon Consultancy, said: "We do not need to blackmail companies into joining the association. We expect them to join because they want to join and can see real benefits of membership."

Evidence of the practical benefits work the CSA has undertaken in its first three years include a growing involvement in providing input to government bodies, such as Neddy, to ensure that the services industry plays an influential part in policy making.

In helping to increase exports from British services companies, the director general of the CSA, Alan Benjamin, visited Japan earlier this year, and this could lead to an agreement with Japanese industry.

The CSA is currently co-ordinating a British computer industry mission to Mexico (CW, September 7).

The association is also playing an active role in trying to take action to help solve the current staff shortage problem by increasing awareness of the career potential among school leavers.

'Facsimile machines in all French homes by 1985'

A FACSIMILE machine in every home by 1985 is just one of the ambitious plans of the French PTT, which is rapidly becoming the innovative leader among the European telecommunications authorities.

The French are also enthusiastic promoters of the planned satellite facsimile mail link to New York and Washington, which they hope to have in operation by the end of next year.

On the data front, the Transpac packet network is due to begin service at the end of the year, and Transmic, an all-digital medium and high-speed point-to-point service is being introduced between major centres.

Next year, the PTT will launch its rival to both viewdata and teletext, which is now called Videotex.

The plans for a home facsimile service are going ahead, but not without some opposition from within the PTT itself. The service has been proposed by the telecommunications side, which sees it as a good way of pushing up usage of telephone lines. However the postal side has plans of its own to introduce a facsimile service between major cities, which would involve letters being transmitted to receiving centres and subsequently delivered by hand in the usual way.

A key feature of the home facsimile service is the requirement for a low-cost, high-speed machine with a target price of 1,500 francs, £175 per unit in quantity (CW, May 25).

Four companies have been invited to submit two fully engineered prototypes each by February, and first deliveries are scheduled for September 1980.

The specification calls for a standard A4 page-size, the ability to receive up to 100 documents automatically, two minutes average transmission time, 1,728 points per line horizontally and 3.85 lines per millimetre, with Group 3 facsimile compatibility.

One of the companies bidding, GCE's CIT-Alcatel subsidiary, believes the target can be met. It is developing a microprocessor-controlled device with several custom LSI circuits which will use electrocatalytic paper, said to be the cheapest option, and can either have an acoustic coupler or built-in telephone handset and keypad.

The other three companies developing rival products are Thomson-CSF, Matra and Sagem.

The UK, Germany, Holland, Belgium, Iran and Argentina are all involved in the plans for facsimile mail services to and from the US, but the French are showing the most enthusiasm. Their service is to be called Teleposte, and they are promising a two-hour service from delivery of the document at the Paris centre, and reception either at the World Trade Centre in New York, or in Washington.

The Transmic digital data network has just started service and is due to be available between 15 French cities by 1981. The point-to-point service will offer medium-speed digital transmission at between 2.4 and 48K bps and high speed service at between 128K and 2,048K bps.

● Plans are also progressing for a major travel service using Transpac. Called STT, Service de Téléinformatique Touristique, it will put 2,000 French travel agents in terminal contact with a Univac 418-based switching centre at Issy-les-Moulineaux, which connects together all the French reservation systems including Air France, Air Inter, the railways and the hotels. A single standard terminal from a French manufacturer will be used, leased from the PTT.

Belgian videofiche in spotlight at Sicob

A MULTI-ACCESS computer-based document storage system from Belgium headed a strong line-up of new European products introduced at the Sicob exhibition in Paris this week.

Other noteworthy introductions included the first of a new range of VDU-driven business computers from Olivetti, a cluster terminal version of the Datasaab Alfaskop, a complete new range of networking hardware and software from Philips, and a personal computer from Logabax.

Called Videofiche, the document storage system comes from Brussels-based systems house Correlative Systems International, which developed the system on request from the EEC Commission and wrote the software to run on General Automation hardware.

The Olivetti BCS 3030 is the first of a long-awaited line of screen-based business computers from Olivetti. Based on the technology of the TC 800 terminal system, the BCS 3030 comes with one or two displays, is programmed in PL/I, RPG II or assembler, offers partial compatibility with the A series of office computers and is in the $20,000 to $50,000 price range.

The cluster version of the Datasaab (formed by Stansaab) Alfaskop is called the System 41 and consists of a range of Motorola 6800-based modules including displays, floppy disc drives and printers.

Philips has assembled its range of distributed processing products into a complete networking system called the PTS 6000, built around two of the company's minicomputers.

The P357 mini, capable of supporting 300 Megabyte disc drives, is used at the host processor site, with smaller P351s used as regional concentrators and local processors.

The Logabax personal computer, called the LX 500, is built around the Zilog Z80 micro, includes one or two mini-floppy drives and is programmed in Basic.

Apple's new machines

WITH ITT now completing its plans to enter the personal computer market with Apple machines, Apple Computers itself is pushing ahead with plans to enhance its product range.

Andre Sousan, Apple's president of international operations, says that a new machine to be introduced in the middle of next year will probably be known as Apple III. Meanwhile this December, the company will be launching Apple IIA in the US. This will be similar to Apple II with the addition of Applesoft Basic software in ROM.

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PRIME

Employing the disabled–guidelines are needed

By Steve Shirley

SOME of the results of the survey carried out by the BCS's Specialist Group for the Disabled could, perhaps, have been predicted. Others proved to be both new and of real practical help to the disabled seeking to enter the industry or to move around within it.

The survey was financed by Computer Weekly's charity ball. It had two objectives. Firstly, to get a quantitative feel for the employment prospects for the disabled within this profession with its screaming requirement for yet more and more good staff. Secondly, to provide a national register of employers which were prepared to consider, on their merits, those with disabilities of different kinds.

The BCS would have liked to have responded individually to the many people who took the trouble to collect statistics, think about the problems, fill in their forms and return them. On behalf of the Group, may I therefore take this opportunity of thanking all those who took part in the survey.

Thanks are also due to the many willing volunteers, including those at the Newbury College of Further Education (who handled the incoming survey forms as a practical training exercise) and to CRC whose computer facilities were made available and from whose database potential employers' information can now be accessed.

Expectedly, the main reasons given by employers who had no experience of disabled personnel within the DP area were unsuitable premises and the fact that no disabled person had ever even applied. One wonders who received those dozens of application letters sent out by each of the students from the TOPS sponsored courses run at Kelvedon (CW, September 7). However, the number of the disabled seeking employment is very small compared to the number of establishments polled.

But the proportion of people disabled through accident who decide to return to employment is expected to rise. For, harsh though it may appear, we now start talking about retraining and employment to the newly disabled only six short weeks after the immediate accident concussion is over.

So there one is, talking to a young man whose life has been shattered in a motor accident, still in plaster and bandages, traction and intense pain, saying briskly, "Now, what are you going to do about a job?" The "kind" way, the easier way, is to wait for a partial or full recovery to whatever physique is left. But that is too late. One has to talk with angry young men while they are still angry and still shocked.

Most responding employers who are fully prepared to consider employing the disabled in the data preparation and programming areas, expressed doubt or even complete unwillingness to consider disabled applicants for systems work. Obvious? Communication and mobility problems were the usual rational reasons given.

The proceeds of CW's 1977 Charity Ball were given to the BCS Specialist Group for the Disabled, which used the money to finance a survey into employer attitudes to the disabled. Here Steve Shirley, director of F International, and a member of the Specialist Group's Committee, discusses the results.

I suspect also that the possibility of user embarrassment is a factor. Certainly, there are personal as well as technical qualities required of systems people. Does disability make a person unacceptable? A chip on the shoulder certainly does.

Few respondents seem aware of the financial incentives available for the modification of premises to facilitate the employment of the disabled. Even fewer are aware of electronic gadgetry like the Optacon, which allows a totally blind person to "read" normal print or text on a VDU.

Replies on the acceptability of people having difficulty with writing are especially revealing. This disability was considered by many respondents as insuperable for a programmer. Yet in programming the amount of input and output (reading and writing) is a very small proportion of the overall activity.

Data preparation, numerically the largest section, was generally considered to be wholly suitable for most disabilities except blindness.

Remploy, which is in being to provide meaningful employment to severely disabled persons, is of course exceptional. Most of the small installations and quite a few of the bigger ones have reservations about keeping a sensible balance.

Colleges surveyed have a generally different attitude to the employment of people in wheelchairs, since special facilities are often already installed.

Employers' attitudes bracket the blind and those in wheelchairs together as regards mobility.

Many people honestly admitted personal doubts about their ability to "cope" with a severely disabled employee. A typical question would be: "Would I myself need training to manage a deaf member of staff?"

Such findings are among the most useful points to emerge from the survey. Employers are really asking for factual, unemotive guidelines as to what the various disabilities are; what they imply; what aids are available to someone with muscular dystrophy or multiple sclerosis, a paraplegic, a deaf epileptic? where from? who pays?

This problem is about to be tackled by the NCC London and South East Region Members' Committee under the chairmanship of Fred Thomas.

A recent report from the Consumers' Association mentions the 54 different forms of financial assistance and 18 types of supportive service available to disabled people at home from 17 different kinds of agency. It is obvious that similar hangups exist in the employment area.

The second objective of the survey was to provide information for disabled people seeking employment in the industry. Practically all respondents stated that they were willing to have their name, with stated preferences as regards the various main disabilities, entered in a classified register.

This register is now available via terminal link to the database held on the CRC computer. To access it, contact Ron Potter, Emphatic Computer Services (Stoke Mandeville) Limited, Andrews Way, Industrial Estate, Bicester Road, Aylesbury, Bucks, or Dr Hamish Sloan, the Newbury College of Further Education, Newbury, Berks.

Additional access points are planned for Manchester, Cardiff and at the new BCS HQ. The BCS inquiry desk already equipped complete with telephone only needs someone to man it.

To conclude with two hopeful realistic questionnaire answers: "... problem in recruiting finding outstanding people. Being handicapped would be secondary, though a significant, problem. We having had any contact with disabled people ... It has therefore, not been easy to answer questions objectively. But I answered them in good faith trust that this has been assistance."

Indeed it has.

Downtime by Chad

Riding for a fall

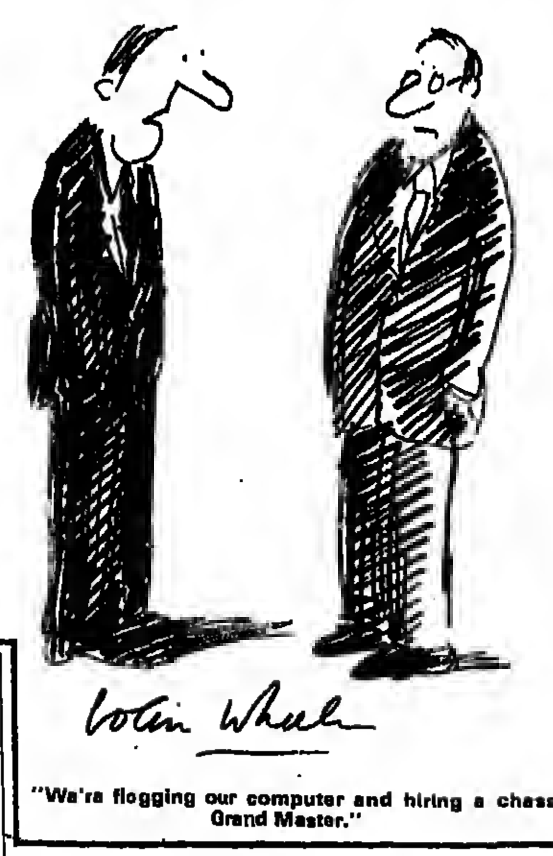
THERE is an awful feeling that comes over a speaker when he realises that he has just opened his mouth and put his foot straight in it. At a press conference for the NRDC last week, Ben Boltz, that doyen of science journalists, asked a rather barbed question suggesting that the Corporation should be putting the screws on its own marketing people to get them to promote its products more effectively. Managing Director Bill Makinson replied, "If the customers aren't there, there's no point in flogging a dead horse."

It was a howl of laughter from the audience that made Makinson realise with horror that he had just described his own salesmen as dead horses! Presumably the salesmen would be distinctly angry at the implication that they are so inactive as to appear dead, but then they would be horses of another choler.

Meaning fool words

NOW, fellows, jargon is all very well, but there are limits. We all accept that, in this business particularly, all our mind-boggling new inventions will have puzzling new names. After some effort we can usually figure out what are Content Addressable Parallel Processors and Store Multiple Access Controllers. But now, IBM has brought out a device called a 5340 System Unit.

I mean, I think I even have a vague idea what a System Support Programme Interactive Communication Feature is, but what the blazes is a System Unit?



"We're flogging our computer and hiring a chess Grand Master."

Homeostasis

Alone on the creaking boards
I tread, an actor on a darkened stage
Lit by little that is steady
Or illuminating:
Far, far away my audience,
Also in the dark.

Thick, thick air converts my lines
From waves of love to shifts of pressure
On muffled drums
Too faint to start a sound
Yet strong enough to thrill
Timpani tuned to me.

Invisible, save to myself, who –
Failing my own true listener –
Must use a glass,
I catch, my ears attuned just now
To my own note
(Which is hers, and therefore ours),
The faintest fibrillation
Of the prickling fronds within
And know that I am heard:

The feedback only possible
When our two systems
Are aligned to work as one.

D.C. Mitchell

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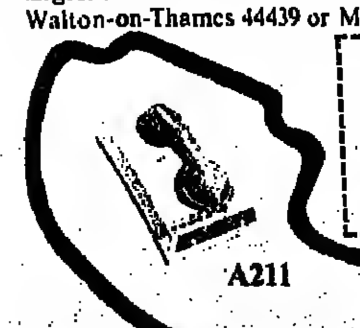

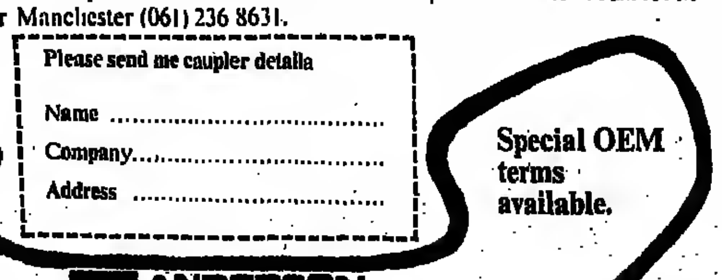

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Threat to government projects

● From Front Page

say that "We have set up a joint review team with the SCPS and the Civil Service Department to look into this latest claim, but it is too early to report anything."

Current wastage levels within the Civil Service are about 20% per annum, according to the SCPS, based on figures recorded during the second quarter of this year. In 1975, wastage was only three to four per cent.

"Government incomes policy has been the main problem," said Christie. "The 12-month rule and the 5% pay ceiling are barriers, and the Civil Service Department has indicated that our claim is in conflict with these and that this may cause problems. But we are going to pursue this claim."

In support of the SCPS claim, Christie drew a comment from the report prepared under the chairmanship of Robert Wilding, deputy secretary of the Civil Service Department. The report was entitled "The Longer Term Review of Administrative Computing in Central Government" (CW, June 8), and the comment was: "This problem (of staff losses) must be dealt with urgently if government computer operations are not to be imperilled."

Projects that could be affected by the staff shortage include the Inland Revenue's plans to computerise PAYE operations (CW, February 9), and tax collection. Also as over 100 computer staff have left Ministry of Defence installations since July [illegible] there is concern for MoD operations.

"An added factor here is the threatened move of MoD computer staff to Glasgow in the early 1980s," added Christie. "This will not help the situation."

Handy sized model of Mavis

PROTOTYPES of a briefcase-sized version of Mavis, the micro-based system for the handicapped (CW, September 15, 1977) have been developed by Ferranti. Originally developed jointly by the National Physical Laboratory and Loughborough University, the system has already attracted the interest of the Department of Health and Social Security, and generated more among handicapped people when it was demonstrated at the Naidex 78 conference in Brighton last week. The DHSS is already evaluating the Mickie patient interviewing system (CW, February 16). Mavis and Mickie are projects being carried out by the newly named Division of Numerical Analysis and Computing Science at NPL.

ABOVE: Mavis then . . . BELOW: Mavis now.

Ferranti will produce four Mavis prototypes (likely to be known as Mascot commercially) three for outside evaluation over the next year and one for internal systems development work. It will not be commercially available until all evaluations have been completed, but has been given a likely price of "under £2,000".

The prototypes are based on the Zilog Z80 microprocessor and incorporate 14K of PROM, 16K of RAM, and 128K of CCD memory.

Each Mavis weighs only 21 lb and measures 16 x 15 x 5 inches and comes complete with a keyboard, a mini cassette drive and various interface ports.

Connection to a standard television, which acts as the display unit, is achieved either by using a UHF device that plugs into the aerial socket, or a minor internal circuit adaptation.

"Users of Mavis have a number of options for inputting or changing the format of information on the screen," explained Julia Howlett, project leader at NPL. "They can use a mouth-operated switch to select letters from the matrix at the bottom of the screen or two big buttons which they strike."

The correct combination of cursor movements selects letters from the matrix and writes them on the screen above.

"We have paid a lot of attention to the keyboard layout so that those used to touch typing can operate control keys with minimal hand movement," said Howlett. "Among the facilities offered on the system are a quite sophisticated text editor/handler, the ability to operate an environmental controller which switches on lights or an electric fire remotely, and a graphics mode which allows pictures to be constructed and coloured in."

The system is flexible, however, as a programming language called Plum (Programming Language for Users of Mavis) has been develloped. One example of its use is that programs to teach young handicapped people how to use Mavis can be written and run on Mavis using Plum.

Chubb in US licence deal

A LICENCE has been granted to Diebold of Ohio by the UK security equipment firm Chubb and Son for the use in the US of Chubb's patents for cash dispensers and automatic teller equipment. In return, Chubb is receiving a licence for Diebold's patents and $680,000.

The automatic banking equipment is manufactured by subsidiary Chubb Integrated Systems. Two years ago Chubb made a similar patent licensing agreement with IBM.

CMG chalks up turnover of £8.5m

WITH turnover of £8,523,470 for the 12 months up to the end of April, 26% up on the previous year's figure of £6,780,415, CMG (Computer Management Group) chairman Bryan Mills is confident that this growth pattern will be maintained. Although pre-tax profits for the group were £270,154, with an after-tax figure of £120,292 showing a return on sales of only about 3%, Mills says he expects to see considerably increased profit margins over the next few years. Last year's profit figures were, respectively, £177,492 and £71,943.

Mills points out that these figures are indicative of the group's policy of reinvestment which has been followed since it was founded in 1965.

Like most other computer-based businesses, CMG faces acute staff shortages in the various professional grades, and Mills says that some expansion has been slowed up because of this.

At present the group has a total staff of over 420 of whom about 70% are computer professionals. All employees take part in a profit participation scheme which in the year up to April, 1978, provided £268,105 to be distributed.

CMG is considered to be the biggest bureau operation of its type in the UK and it is now in the process of upgrading its hardware. Its Burroughs B4700s are being replaced by B3800s and the first of two for the Croydon, South London, data centre is now being installed (CW, February 2). A third B3800 will replace a 4700 at the group's Amsterdam centre and all three 3800s are scheduled to be onstream by next spring. The machines are being rented from Burroughs at a cost of £500,000 a year and CMG believes that it is now the biggest non-banking Burroughs user in Europe.

The Croydon 3800s will be front ended by twin B800 machines which will enable all peripherals and user lines to be switched as necessary to either mainframe.

During the past year two 1200 systems which had been bought from Honeywell after several years' rental, were sold for scrap at £200 a piece and are shown as an £80,000 write-off in the annual accounts.

Special preference for micros is 'irrelevant,' says NRDC boss

SUGGESTIONS that the National Research Development Corporation should give special preference to microelectronics have been dismissed as irrelevant because the Corporation's grants are not limited by resources.

William Makinson, NRDC managing director, said that as it had never had to choose between two worthwhile projects because of lack of money, the question of preference did not arise.

The Acard report on the applications of microelectronics published last week (CW, September 21) recommended that priority in government investment should be given to projects involving semiconductors in order to help the UK catch up on this important technology.

Makinson pointed out that very large scale investment was the Department of Industry's field rather than NRDC's (which spent £6 million total last year) and so the Acard recommendations did not really affect the Corporation. Proposals were considered on their merits, whether they involved micros or not.

Of the inventions and proposals submitted to NRDC for support, only 1% of those from private inventors were accepted as worthwhile, Makinson said, while 20% of those from industry were accepted. Money was only invested on a commercial basis, and the shortage was one of good ideas rather than money.

The number of proposals NRDC receives that involve mechanical engineering is noticeably falling, while those in computers and electronics are on the increase.

In answering questions about the Corporation's income, Lord Schon, the retiring chairman, said: "One of the weaknesses in our effort is having to be open." He felt that more secrecy would help in its commercial ventures. He refused to give figures on how much NRDC had earned from its successful ventures.

Upkeep update?

COMPUTERS should be used much more than at present to help keep track of the maintenance of council houses, according to a study by Logica for the Department of the Environment.

Intel drops the 2464

WITH the storage capabilities of MOS RAMs increasing rapidly, Intel has decided to drop its entry into the 64K charge coupled device memory market, the 2464. This has prompted National Semiconductor, a second source for the part, also to abandon its development programme for the device. CCD memories are serial, rather than random access, and the only advantage they have had over MOS RAMs has been storage capacity. With Texas Instruments, recent announcement of a 64K MOS RAM, that advantage is rapidly disappearing.

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Teletype 28 KSR	75	60	50

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MICHIE'S PRIVATEVIEW

Epistemic illusions

RICHARD Gregory has characterised a wealth of self-deception in the special realm of visual perception, the "optical illusions". I see these, however, aa merely a special case of a broader class of "epistemic illusions". These result wheoever we falsify in order to understund.

Faced with complex material, the history of science for example, we tend, whatever the coat to accuracy, to file facts by stereotype. There is no better illustration thnn certain broader aspects of the Galileo story.

Galileo is remembered as a rational and honest mind standing courageously against church bigotry and the dark forces of the Inquisition. This scenario acts as a summarising anecdote, a soothing mnemonic for overloaded minds. It is, after all, historical fact that the new astronomical physics encountered theological opposition. Rather than memorise such a dry abstraction, can we peg it to a good story?

In his marvellous book "The Sleepwalkers", Arthur Koestler marshals the documents in the case. They tell a quite different tale, of an abrasive prima donna bent on provoking a mild and sophisticated Vatican intelligentsia into confrontations where he can shine.

How little these mature and cultivated men were concerned to muzzle the voice of reason may be judged from an excerpt from the correspondence of the Pope's leading theologian of the day.

In a letter written in 1615, Cardinal Bellarmine, who was to issue against Galileo the admonition of 1616, stated "... for to say that the assumption that the Earth moves and the Sun stands still saves all the celestial appearances better than do eccentrics and epicycles (Bellarmine is referring here to the epicycles of the Ptolemaic system) is to speak with excellent good sense and to run no risk whatever. Such a manner of speaking suffices for a mathematician." And again, ". . . if there were a real proof that . . . the Sun does not go round the Earth but the Earth round the Sun, then we should have to proceed with great circumspection in explaining passages of Scripture which appear to teach the contrary, and we should rather have to say that we did not understand them than declare an opinion to be false which is proved to be true. But I do not think there is any such proof since none has been shown to me. . ."

As the Vatican astronomers were doubtless aware, Galileo had no proof.

In the short term he temporised by pretending that his critics would be too stupid anyway to understand his proofs. In the longer term his campaign culminated in the publication in 1632 of a Dialogue on the two world-systems which finally precipitated his trial. In this work he pressed into the service of proof a wholly fallacious theory of the tides, pouring scorn at the same time on Kepler's view that they were something to do with the moon.

It is hard not to reverse the labels "reason" and "bigotry" which tradition has assigned to the two sides. Yet false tradition prevails because the truth so often has awkward corners. Why not make the jigsaw easier with a little sandpapering?

Today there is a new factor. Computer extensions of human powers of thought and memory will surely lessen our dependency upon stereotypes. Being able to handle more complex systems of information we may learn what the moralists and pedagogues have failed to teach us, and so outgrow the urge to falsify. Fewer epistemic illusions, more command of detail: we may yet come to cherish the multifold corners of things as they are.

85% cut in execution time of Basic claimed

WITH the addition of address relocation translator support, Gulf Computing Systems has claimed a reduction of up to 85 per cent in the execution time of its Basic interpreter for IBM's Series 1 (Software File, July 6). The feature requires a Series 1 system with address relocation translator hardware and at least 128K of memory.

In use, the operating system and interpreter overlays are held in the extended memory, while programs are executed in the primary 64K of memory. Overlay loading then involves fast memory to memory transfers.

When an overlay is needed, the address relocation translator is enabled only for the transfer of the overlay from extended memory into the overlay area. Disabling the translator during normal execution avoids the instruction speed degradation associated with address translation.

Installation tuning key to better MVS

THE complexity and high resource requirements of IBM's MVS operating system leave major scope for performance improvements through installation tuning.

A paper in the latest IBM Systams Journal (Volume 17, Number 3) discusses a procedure of observation and correction for cuarse tuning of an MVS system by analysing it into its software and hardware components.

Tuning, the paper notes, is generally iterative. That is, the elimination of one bottleneck usually leads to the identification of another. Nonetheless, even coarse (or "first-stage") tuning can produce dramatic performance improvements, typically bringing the system to within 60-70% of optimum efficiency.

The paper focuses on three key resources — main storage, CPU capacity, and I/O devices — any of which can form a bottleneck through over utilisation.

Statistical information on the use of each resource is provided in MVS by Measurement Facility/1. It notes, going on to give guidance on the maximum and minimum utilisation of each in a typical well-balanced system.

Excessive address space swapping, leading to increased CPU and I/O loads, is usually the most significant bottleneck to be encountered.

Swapping is used by the System Resources Manager primarily to overcome main storage shortages under OS/VS2-3.6 and to reduce the paging rate under Release 3.7. A major factor in either case is an excessive number of batch initiators started.

To reduce batch swapping, the paper argues, the initiator structure should be classified by region sizes used. The sum of the maximum region sizes should then not exceed twice the available main storage not needed by MVS.

The paper also discusses in detail the effect of swapping on TP and TSO applications.

Where a consistently fast TP response time is required, application programs should be set non-swappable, together with IMS control and message regions.

Cortez Plus sale

THE latest customer for Zeus-Hermes' Cortez Plus transaction processing monitor is Short Brothers, the Belfast-based manufacturer of aircraft and missiles.

The software will be run on an ICL 1903T in conjunction with an IDMS database supporting production control. Cortez Plus will be used initially to provide inquiry facilities relating to production progress, bill of materials and work study time information.

Mathematical code for IBM mainframes likely

A NEW mathematical programming code for IBM mainframes could be one of the first products of a company recently set up to specialise in mathematical software.

However the major activity of the firm, Advanced Mathematical Software, is likely to be the development of tools for mini- and midi-computers.

"Mathematical programming software has been associated with computing since its early days," noted managing director John Forrest, "and has historically demanded the largest computers which were available.

"However more sophisticated algorithms have been developed which use less core and no longer need high speed peripherals. Thus with the increased power and sophistication of small computers, minicomputers are now in my opinion better suited to mathematical programming work than large mainframes — for which most previous software has been written."

A particular aim of the company is to develop linear and non-linear optimisation systems and mathematical models to meet the specific needs of client companies. It has been asked by one client to consider the development of an alternative to IBM's mathematical programming system, MPSX.

Forrest was previously a senior consultant for Scicon, where he worked on the design and development of systems including Umpire and Sciconic.

Fortran G extension key element in order for ICL

THE extension of Edinburgh's Fortran G compiler to process programs written to IBM's Fortran Level II Extended standard is understood to have been a key element in the sale of two ICL 2976 systems to the UKAEA's Culham plant (CW, September 14).

ICL has offered the Edinburgh compiler as a standard product since early this year. It asked Edinburgh to upgrade it to the full Fortran H standard in the spring.

The software was at the same time extended to be compatible with ICL System 4 Fortran, another Culham requirement.

Possibly signalling a new concern with 2900 software compatibility, the development chiefly involved catering for asynchronous forms of I/O expressions, and providing extended facilities for quadruple precision. There was also a relaxation of statement ordering rules.

● Version 30 of the Edinburgh compiler is to introduce character variables and internal read/write statements consistent with the Ansi Fortran 77 standard. The software is due to enter service on the Edinburgh regional system in October.

PROGRAMMER NOTES

Avoid unnecessary case analysis, says Dijkstra

PROFESSOR Edsger Dijkstra delivered himself of two interesting pieces of advice for programmers at Lancaster University the other week (CW, September 21).

The first was to avoid unnecessary case analysis — as exemplified in the specification Zero, one, or many.

The second was to avoid trying to capture the properties of a set by looking at individual elements; in short, to avoid examples.

Both maxima nicely illustrate one of Dijkstra's main themes at Lancaster, namely the degree to which mathematical thinking can — and should — permeate programming practice.

For in both cases, the maxims derive naturally from a mathematical approach so that mathematical expression of a problem would lead automatically to a solution embodying the principles.

Professor Dijkstra, who said that he regarded programming as a branch of applied mathematics, noted however that all vigorous mathematics is a subtle balance between formal methods and common sense.

Many programmers would argue that they already use principles such as those indicated by Dijkstra, probably suggesting that they constitute part of the "art of programming."

Such talk is often followed by invoking the idea of elegance — an attempt to localise aspects of program design that are felt to be more than purely subjective, but not wholly objective.

But those who have tried to argue for a design on grounds of elegance will know that it rarely works towards achieving agreement, usually on the contrary revealing that ideas about "elegance" are highly diverse.

It is, presumably, one object of program design methodology to reduce such differences, by clarifying the theoretical foundations for particular design techniques. Is it self-evident, though, that a mathematical foundation will support the most serviceable structure?

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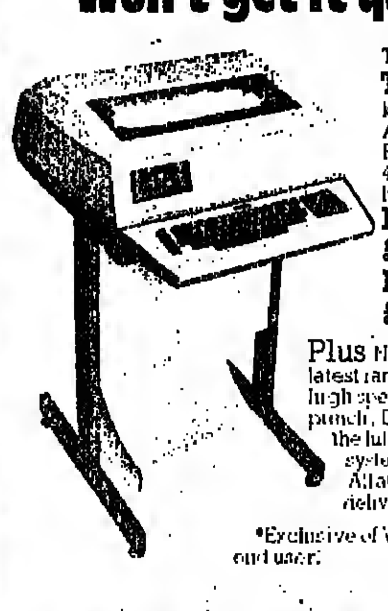

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November meeting for ISO over Minimal Basic

THE American National Standards Institute has adopted with only trivial changes the minimal standard for Basic devised by the European Computer Manufacturers Association. And the standard has been submitted by ECMA to the International Standards Organisation, which will meet to consider it in November.

Work is also well under way on the definition of Level 1 extensions to the language, which could be incorporated in an Ansi standard in 1980 and a subsequent ISO standard in 1981.

ECMA published its Minimal Basic standard, ECMA-55[1], in January this year. The Ansi standard, designated X3.60-1978 Minimal Basic[2], was published in July and is identical in its definition of the language.

"The documents differ marginally in wording, but this doesn't affect the substance of the standard at all," according to Gordon Bull, of Hatfield Polytechnic.

"For example, ECMA uses the ISO character set, so that ECMA refers to a 'full stop' where Ansi refers to a 'period'".

ISO has already solicited responses to the standard from its member countries "competent in programming languages" and the great majority are understood to have voted for accepting the standard.

One exception is the UK, whose response was formulated by the British Standard Institute's DPS/13 committee. This panel has objected to the standard's treatment of default base setting for arrays.

An expert committee is due to meet in Washington in November to consider the national responses, to which ISO is obliged to reply. A majority vote is, however, sufficient for the standard to be adopted.

Work on the definition of future Level 1 extensions is being shared by three groups: Ansi X3J2, ECMA TC21, and the Purdue International Workshop on Industrial Computer Systems.

According to Bull, who is co-ordinating the efforts of the three groups, some 14 areas of the language have been identified as extensions; each group is working separately on a number of allocated areas.

The Purdue group, for example, which consists of Purdie's TC2 committee, is looking at real time facilities, exception handling and debugging. Other areas being studied include graphics, formatting, subprograms, matrices, files, strings, chaining, extended precision and maths functions.

"Proposals in about seven of the areas are already in a pretty finished state," said Bull, "and the hope is that by circulating them between the groups they will iterate to stability.

"We expect to have all 14 finished by next April and we will then be able to produce a draft in the format required by about July. A meeting in November 1979 will consider initial responses to the proposals, which would then be published for public comment early in 1980.

"A joint ECMA/Ansi standard could then be published late in 1980, with an ISO standard following a year later."

Bull noted that three levels of extension had originally been envisaged. Level 1 had been intended to define minimum capabilities in each area examined, and was to have been followed by separately identified Level 2 and Level 3 capabilities.

However Level 3 had turned out to be non-existent, he said, and most people now felt that the Level 1 extension took the language far enough.

Of the two documents available, Bull said, "The Ansi version is the better, and is likely to be followed more closely by ISO. It includes, for example, an index of syntactical elements, which the ECMA version does not. The ECMA version, however, is free."

[1]ECMA-55, European Computer Manufacturers Association, 114 Rue de Rhone, 1204 Geneva, Switzerland; free of charge.
[2]X3.60-1978 Minimal Basic, American National Standards Institute $6.50. Overseas Sales Department, British Standards Institute, 101 Pentonville Road, London N.1.

CPP close to offering first DBMS products

WITH the deal between Applied Data Research and Insyte Corp (Software File, August 31) a step nearer to completion, Computer Program Products is one step closer to offering its first DBMS products.

It was learned this week that ADR has signed an agreement under which it will pay about $2.5 million for Insyte's software business. Only shareholder approval now remains to be obtained for the deal to become final.

CPP, the software products arm of the CAP-CPP group, is the usual agent for ADR products in most European countries. It is therefore the prime candidate to handle European sales and support of the Datacomm/DB database and related products being acquired by ADR in the Insyte deal.

Sandy Cormack, managing director of CPP, said: "ADR has offered us a licence but is chiefly concerned at the moment with its home market. We expect to see them in about six weeks to discuss our plans for marketing the range in Europe.

"From what we have seen, the software looks technically very good. A particular attraction is that the whole Insyte range is designed as a family."

Insyte is understood to have installed about 200 software packages at over 100 user locations. There is thought to be only a handful of users so far in Europe.

Puzzler

IT had to happen! Someone has at last come up with an anti-smoking alphametic, as follows:

```
   BLOKE
  SMOKES
   BLOKE +
  -------
  CROAKS
```

The composer is a Canadian called M. R. W. Buckley and his only condition is that S must be odd. See page 53 for solution.

Handbook authoritative review of file design

COMPUTER Weekly has published a handbook* on file design, closely based on the series of 12 articles by Owen Hanson that appeared in the paper last year (July-September).

An authoritative review of file design, the series is essentially a practical guide for the commercial DP professional. It omits both the very basic principles that are available in elementary textbooks, and the full theoretical derivation of the principles discussed.

The content is very little changed from the original articles. In some chapters, there has been a slight expansion of the text and several chapters benefit from additional diagrams. The most notable change is the consolidation of the first and second articles into a single chapter seven in the book.

*Basic File Design, by Owen Hanson. 58 pp. £1.50 including postage. General Sales, IPC Business Press, Dorset House, Stamford Street, London SE1 9LU.

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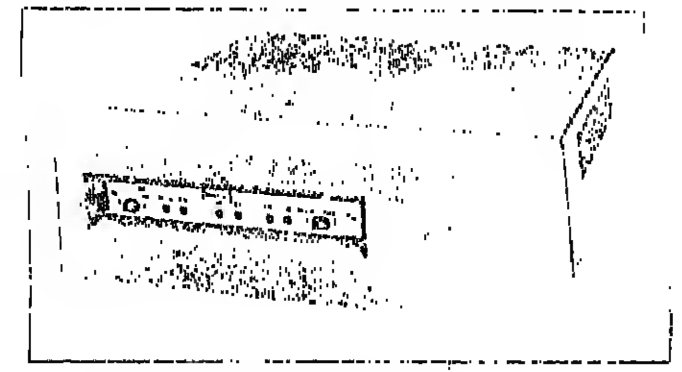

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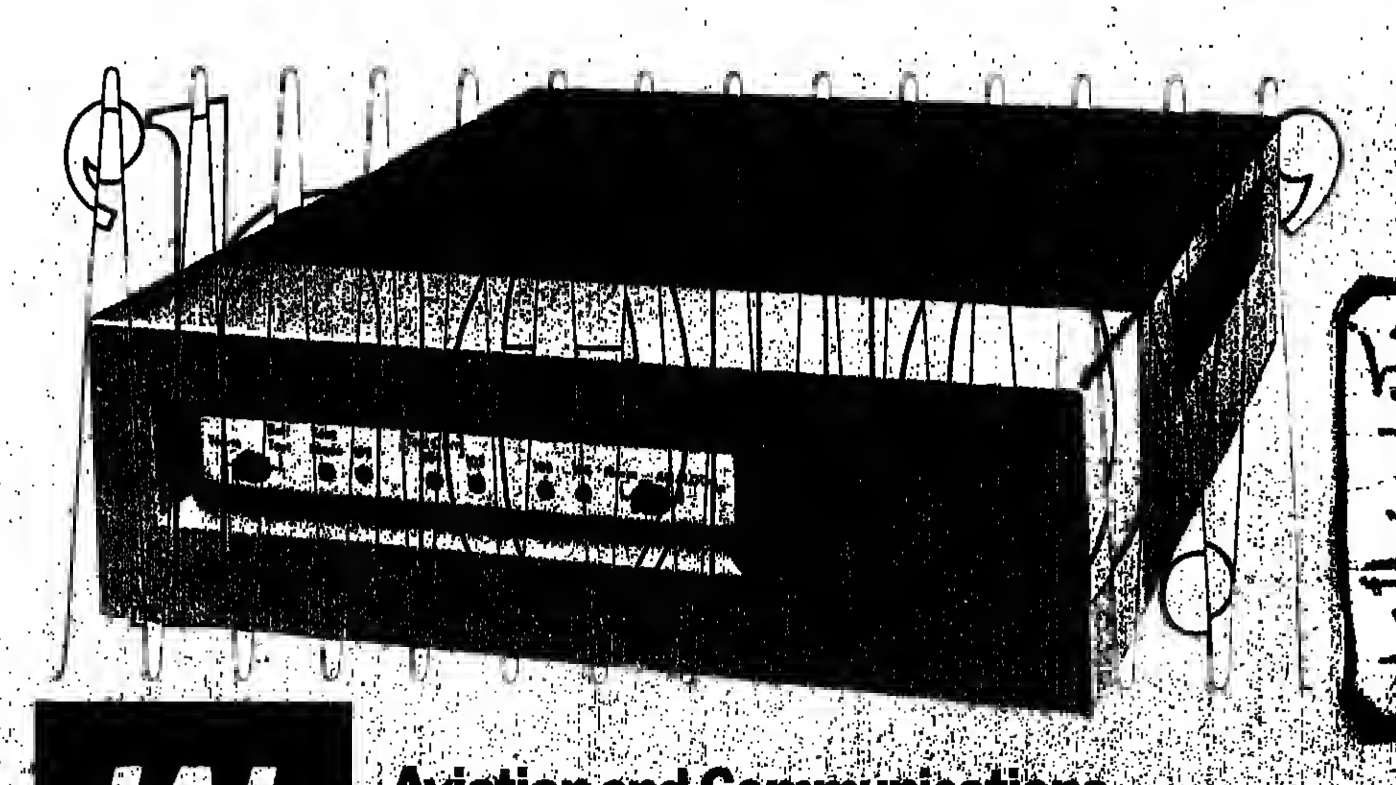


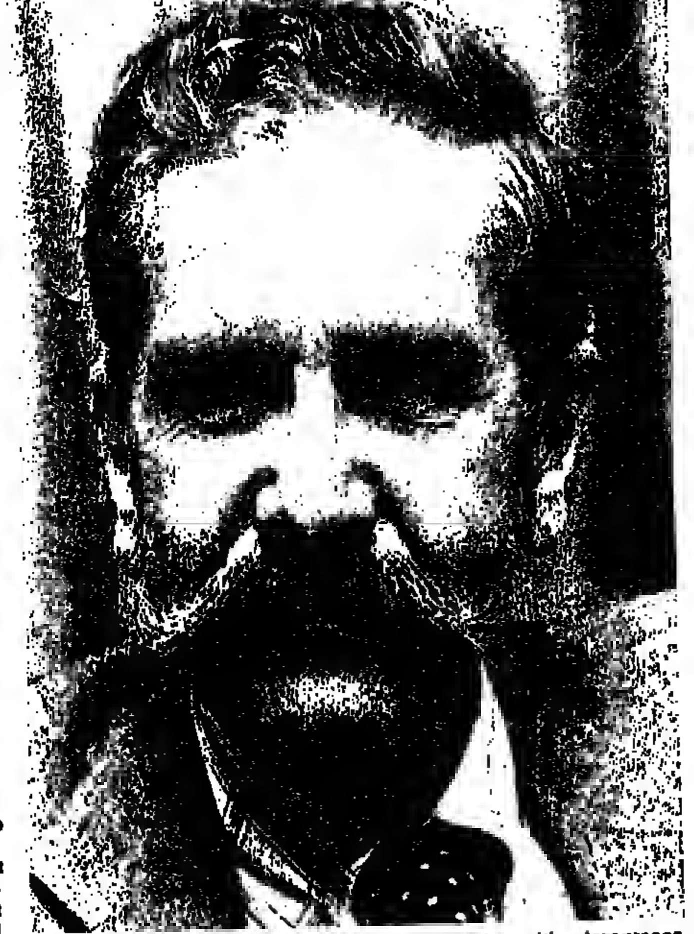
IAL Aviation and Communications Systems and Services — worldwide

ABOUT 450 miles south of its headquarters at Santa Clara, California, National Semiconductor has a plant at San Diego which, says National, is now turning out more medium/large mainframe processors than any other computer manufacturer apart from ISM.

These processors are sold to end users all over the world by Itel as the Advanced Systems AS/3, AS/4 and AS/5, the latter matching the 370/158 and 3031 in performance.

National's president, Charlie Sporck, is delighted with Itel's performance with these machines and he hopes that Itel will be able to sell National's bigger ISM compatible processors now under development. At present Itel gets its top end machine, the AS/6, from Hitachi.

Sporck is determined that National should stay in the ISM compatible processor business and says, "We have a development programme based on the projected ISM H Series, although I am not prepared to predict precisely what form IBM's new big processors will take. However, I believe we will need to be very effective with microcode. This will be critically important. I think that, VLSI logic cheap enough to be customised and retrofitted in the field, could be an important feature of the new IBM hardware. It should be easy to retrofit when there are only a few VLSI devices involved."


CHARLIE SPORCK . . . "This talk about automation with microprocessors reducing employment is garbage."

'Talk about micros reducing employment is garbage'—Sporck

"GARBAGE" is the word that Charlie Sporck, president of National Semiconductor uses to describe warnings about microprocessors causing mass unemployment.

Talking to Computer Weekly during a visit to the UK which also included an inspection of his company's brand new semiconductor plant at Greenock in Scotland, Sporck said, "This talk about automation with microprocessors reducing employment is garbage. Improvements in productivity brought about by automation increase employment rather than reducing it.

"In addition, just look at all the new jobs being created by new microprocessor-based products in areas like the automotive industry. Our own customer list for devices is a lot different than it was only two years ago."

Sporck regards the establishment of Inmus, the UK's own bid to become a manufacturer of general purpose microprocessors and memory devices, as basically a good thing. "The application of computing power through microprocessors will be so pervasive in the future that companies and countries that dominate the computer industry will dominate industry as a whole."

National Semiconductor itself is already an important part of the UK semiconductor industry by way of its manufacturing operation at Greenock although a big question mark hung over Greenock's future last year after the plant was destroyed by fire.

"We decided to stay at Greenock and completely rebuild the plant," said Sporck, "because the productivity per employee there and the device yield from the fabrication processes was higher than at our plant at Santa Clara in the US. We lost $100 million in turnover as a direct result of the fire.

"All the wafers fabricated at the new Greenock plant were four inch and could be switched to five when our five inch development programme is completed."

"We are getting Shottky device fabrication going now and MOS fabrication should go in another month."

Asked if he would be interested in getting together with a European firm to form a manufacturing and development operation similar to that being set up by Fairchild and GEC, Sporck expressed reluctance. "We would not want a Fairchild/GEC type deal without political motivation," he stated.

Water board orders 1904S to expand DP

TO HANDLE an online terminal network covering a 5,000 square mile area of Southern England, the Thames Water Authority is installing an ICL 1904S at its computer centre at Reading.

The 1904S will replace a 1903T system and will be linked to terminals that include remote job entry units located at the Authority's Southern Division area office at Godalming, Surrey, and at the offices of Thames Conservancy Division and the Lambourn Division, both of which are at Reading.

The Thames Conservancy Division will also use four ICL 1500 terminals to collect and input data to the 1904S including water quality and hydrometric information. Two other 1500s will be used at the Crossness sewage works and at the Lea Division office at Walthamstow, to input data on river pollution.

In addition, 20 multi-access terminals will be used for applications like water quality modelling, structural analysis, project planning and financing modelling.

Union to study effects on of WP

THE clerical union Apex, concerned about the effect of word processors on members' jobs, is setting up a working party to study WP technology and its implications for careers, job satisfaction, and health and safety.

Most of the members of the union, the Association of Professional, Executive, Clerical and Computer Staff, are office workers who are directly affected by the introduction of word processing equipment. According to David Cockcroft, Apex's head of research, the union feels there needs to be a rapid dissemination of information about WP in advance of any broader studies by the TUC on the effects of microelectronics in general.

Typists and clerks in Apex are likely to be affected regarding their job content, status, and function, by office automation that is already being introduced in many firms. Other members who work on computers will also be affected by WP systems that linked up with DP.

The working party will consist of union executive councillors and rank-and-file members who work in the fields affected. Its report, an interim version of which should be ready in Spring 1979, will be used first of all in negotiations with employers over agreements for the introduction of new equipment. The report will also be fed into the TUC and government studies.

The study will first of all collect information from members on their experience of existing installations, and will also look into the question of VDUs causing eye strain, an issue many members are concerned about at the moment. Later there will be an assessment of the market and the likely development of word processing over the next five years.

The effects of WP on employment levels, career structures, and job satisfaction will be considered, particularly the question of whether the machines will raise members' status to system controllers or lower it to simple machine minders.

Brain scan urged for boxers

BOXERS should undergo an EMI brain scan as part of their routine annual medical, says a report made recently to Denis Howell, Minister of Sport.

The report, from the British Safety Council, also recommends that boxers who have been knocked out should have a brain scan so that any brain injury can be diagnosed and subsequently monitored.

Boxers should have little difficulty in being referred for a scan, since they are already more than 50 brain scanners installed in British hospitals.

Part of the CMC Sovereign key-to-disc system installed at the National Bus Company's Edgbaston office, including two CMC P99 intelligent terminals (foreground). The system is dedicated to the NBC's Market Analysis Project.

Mapping the buses

DATA that will be used to improve bus services is being captured by the CMC Sovereign key-to-disc system installed by the National Bus Company at Edgbaston, Birmingham (shown above).

The Sovereign system is used to prepare information on what buses are used by whom as part of the National Bus Company's Market Analysis Project, MAP, a three-year scheme designed to identify bus service networks which are both needed by the public and economic to operate. The information will be processed on an ICL 1904S.

The Sovereign system, which is used exclusively for MAP work, has 14 keystations, including two CMC P99 intelligent terminals used by supervisors.

Sovereign is a multiprocessor system that can be used for database management and local DP work as well as for data capture, and CMC says that it has received £1½ million orders for it since its launch in July.

Pactel and NAC sign agreement

DESIGN, analysis, testing and implementation of computer and telecommunications networks will be carried out jointly by Pactel and the Network Analysis Corp of New York, under a marketing agreement signed this month.

Pactel has been involved in several network assignments, including contracts from several European PTTs, and will now be able to provide European network users with NAC's software tools, Modular Interactive Network Designer and Graphical Interactive Network Designer.

The latter, known as Grinder, was used in the design of Arpanet and is still used to analyse its performance. The two packages were developed at a cost of over $2 million. NAC is a leader in theoretical work on network analysis.

NAC president, Howard Frank, said, "This link with Pactel means that our specialist expertise will be backed by the technical and management experience of a consultancy with a wide geographical base."

COMPUTER WEEKLY/IDPM WORKSHOP

Computer Weekly in association with the Institute of Data Processing Management

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Because DP is a service function, it depends on its users for ultimate success. But users from the Board to the shop floor differ in needs and outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP.

This practical workshop, to be run by Nigel Laurie of Communications Audit, will help delegates to discover the techniques and approaches that work best in helping successful user relations. The workshop is practical and based on experience. Above all it is participative so that delegates can put theory into practice. A summary of a survey conducted at a previous Nigel Laurie workshop on this subject was published in Computer Weekly on May 25.

For this latest workshop the number of participants will be limited in order that the maximum benefit may be achieved. If you would like to reserve a place please complete the application form and return it to the address shown, not to Computer Weekly or the IDPM. A brochure giving further information about the workshop may be had from Tony Swain, BIT, 40 Bowling Green Lane, London EC1 0NE.

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Please reserve..........places for the Successful User Relations Workshop to be held at the Holiday Inn, George Street, London on Tuesday, October 17, 1978. The fee is £60 (plus VAT £4); for members of the IDPM it is £45 (plus VAT £3.60). This covers attendance at the workshop, coffee, lunch and tea and full course documentation.

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DEC offers low cost MINC lab systems

A LOW cost mobile laboratory system that comes with interchangeable modules for handling a variety of I/O functions has been introduced by Digital Equipment. Called MINC, Modular Instrumentation Computer, the system is configured around a PDP-11/03 and provides the user with a version of PDP-11 Basic that includes commands for sampling and for developing histograms and graphical displays.

An important feature of MINC is an integral IEEE 488 standard instrument bus interface that can support up to 14 laboratory instruments.

Any combination of up to eight interchangeable function modules can be used with the system and the module types include an analogue to digital converter, a digital to analogue converter, a programmable clock, a pre-amplifier, a multiplexer for extending A/D conversion capacity.

MINC can handle serial devices including a VT105 graphic/alphanumeric display terminal that is standard with the system. Special features of the VT105 include graphical "strip scroll" which provides a version of a pen recorder continuous graph.

The basic MINC system includes one Megabyte of diskette storage and a software package that covers statistics, numerical and matrix operations and costs from £8,450 and include DEC's RT11 with a library including file, graphical and routines.

DECsystem 10 for Poly

THREE years of investigation went into the selection of the Digital Equipment DECsystem 10 at the Middlesex Polytechnic that was officially opened by BCS president, Professor Paul Samet, at a ceremony last week. An ambitious machine for a polytechnic to have, it was described by John Duke, assistant director of resources, as "breaking new ground in procurement policy."

The machine (CW, Feb 2) can handle 60 terminals and 80 batch jobs at a time, with batch work submitted either from terminals or from one of two ... The Poly has 13 sites ... North London, at ... minals are based ... the usual printers ... drives, the ... Calcomp plotter ... shortly acquiring ... graphics facilities.

"To justify such a large expenditure, exhaustive studies of operating costs of the machines were made ... with benchmark tests ... cost of electricity ... hardware was ... account."

Univac expands satellite ...

A THIRD earth station is to be added to Univac's satellite communications network by the American Satellite Corp, which built and now operates the first two in Pennsylvania and Minnesota.

The third station, in Salt Lake City, will use the link to develop communications subsystems and terminals, accessing Univac 1100, 90/80 and 90/30 computers via Univac's Telcon Networking System.

Development of control procedures and formats for use over satellite links is a major aim of the network.

This is said to be the first commercial satellite link allowed by the FCC to use five metre antennae, which were previously limited to government agencies.

The cost of these is considerably lower than the previously used large diameter ... fact, it is comparable ... lines with the same capacity.

Law system

A COMPUTER system specifically for solicitors has been introduced ... Called Solicitor ... System, it has been ... jointly by ... firm of solicitors and ... Systems, a software ... specialising in ... cations for solicitors.

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PEOPLE AND EVENTS

Edited by Nancy Pocock

Move up for head of Compower

MANAGING director of Compower Bob Hitchcock has been appointed managing director designate of NCB Ancillaries, which is responsible for all the non-mining companies in which the National Coal Board has an interest, including Compower. Hitchcock succeeds Gerry Jackson, who retires on October 1.

He joined the coal industry in 1956 as divisional organising accountant in the West Midlands division. In this capacity he set up the pilot computer installation in North Staffs, which became a divisional computer centre on its move to Cannock in 1961.

He became the Coal Board's chief organising accountant in 1965, and was appointed to his present position in 1973.

John Shepherd of Reuffon Computers has been appointed customer services South-West branch manager. Previously he was area supervisor for the South-West. Former Northern branch supervisor Ian MacCormack has been appointed customer services Northern branch manager.

From Klenzie, where he was a sales executive, Tom McCall joins Reuffon as territory manager for the London branch, and Charles Wells, who was formerly an analyst programmer with Phillips Industries, joins Reuffon as systems analyst for central accounts South-East branch.

Mike Hampson, previously general manager of Solartron's instrumentation division, becomes general manager of Membrain. This follows the formation of the Membrain-Solartron group from Membrain and the ATE and Instrumentation functions of Solartron. Both companies are subsidiaries of Schlumberger.

Marketing manager Nick Vernon's responsibilities have been extended to cover all aspects of marketing world-wide. Charles Gilliam-Jackson, previously key accounts sales executive with Membrain, becomes general sales manager.

Hampson

Vernon

Alll Giddens, former computer supplies sales manager with Nixdorf, has become managing director of Computer Media Services.

Hugh McAree and Barry Morley have joined Computel as sales executives. Morley was previously an electronic material sales executive with Montedison, and McAree was a major account executive with Rank Xerox.

Richard Leyton has been appointed products manager of Software Implementation Ltd, a VLI group company. He was previously a consultant in the minicomputer division of SIL. Another VLI group company, Computer People Contracts, has appointed Alan Norris, previously systems and programming manager with United Glass. CPC has also appointed Geoffray Richardson as a sales executive; he has moved from sales from a support role within the company. Still another VLI operations company, CoOparators has appointed Gill Hastilman as a sales consultant responsible for contract dataprep staff. She used to be a branch manageress with Kelly Girl.

Graham Vowles has moved from Data General, where he was a salesman, to Kode, as sales executive for the West Midlands.

Don Crowle, previously sales manager, graphics sales with Calcomp, has been appointed associate director graphics sales. Product service manager Peter Sweeney will also retain his previous responsibility for after sales field service, as associate director, technical.

Stanley Rosenberg has been made vice-president, general manager of the US Harris Semiconductor programs division. Previously he was director of government integrated circuit products with RCA Solid State.

This is the first team of the Darmstadt Exiles, who recently played and won their first match in the German Rugby League, while hosting, playing and coming second in their own first tournament. The majority of the Exiles are Knights Computer Services staff working for the European Space Agency at Darmstadt, West Germany, although American servicemen and local German players are also represented in the team. The team gained entry to the major German league at the end of last season because so many of the players have now lived in Germany for more than three years.

Soccer

Results:

Division I

SIA 1, Jadpu 10
Comshare 2, Rank Xerox 2
Jadpu 1, Ontascore 1
Comshare 3, Jadpu 4
Jadpu 4, Rank Xerox 1
Rank Xerox 2, Ontascana 1
Comshare 0, Gryphon 2
Rank Xerox 1, Comshare 1
Gryphon 3, Jadpu 0

Division II

Atkins 2, John Lowe 2
Allargo 3, ICL 1
Ontasolve 2, Allargo 5
ICL 5, Lambeth 0
Allargo 5, John Lewis 3
Ontasolve 1, ICL 4

Division III

Gill & Gullus 0, Autix 5
Aitix 4, Xerox (London) 4
Victoria 1, Aitix 3
3M 4, Ontasolve (West End) 7

Division IV

Computer Wkly 0, C. J Bees 2
Bunzl O S 2, C. J. Bees 0
UCSL 1, Wollorex 6
Computer Wkly 7, Targe 7
Targe 5, C. J. Bees 0
Computer Wkly 4, Wellcome 1
C. J Bees 2, UCSL 1
Bunzl O S 0, Computer Wkly 5
C. J Bees 5, Computer Wkly 0

Division V

Jadpu 'B' 3, Hoskyns 2
Allen C S 2, Jadpu 'B' 2
Jadpu 'B' 2, CDC 6
Shorewood 1; C. 6, Jadpu B 1
Hoskyns 2, Allen C.S 3

Ronald Novak has been appointed general manager of European operations with Teradata Systems Corp of the US, and country manager of Teradata Ltd, which operates in the UK and Scandinavia. Formerly he was assistant to the president of Teradata in the US.

DIARY

OCTOBER 2
Meeting the GEC 4080 Fortran compiler. W. H. Manville BCS Fortran Group Royal School of Mines, London SW7. 11.00.

Computer graphics in civil engineering. Computer Applications and Methods Group. Institution of Civil Engineers, London SW1. 15.00-19.30

OCTOBER 2-7
SEAS anniversary meeting. Share European Association, Stresa, Italy. Details: PMP, IRC Ispra Establishment, I-21020 Ispra Varese, Italy.

OCTOBER 3-4
Series/1 and telecoms groups. Joint meeting. IBM Computer Users' Association. Holiday Inn, Liverpool.

OCTOBER 10
X-series protocols made plain. Roger Scantlebury. BCS Data Communication Group. City University, London EC1 18.00.

A computer in your future car. Mike Lovejoy. BCS. Reading branch. Copper Inn, Pangbourne. 20.00.

How will industry adapt to microelectronics? Dr Brian Spratt, Prof Michael Lanigan. BCS Kent branch. Computer Lab, University of Kent at Canterbury. 18.45.

OCTOBER 10-11
Small systems group meeting. IBM Computer Users' Association. White House, London.

OCTOBER 10-12
Chemical process simulation and design. CAD Centre, Cambridge. Further information from Dr P. Winter; tel 0223 63125.

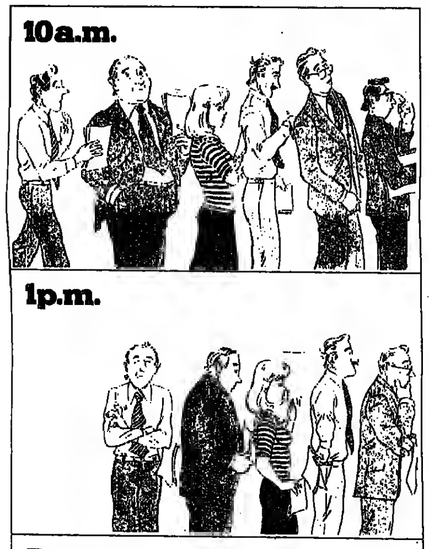
OCTOBER 10-18
Efficiency Beurs, 10th International exhibition office equipment. RAI. RAI Exhibition Centre, Amsterdam.

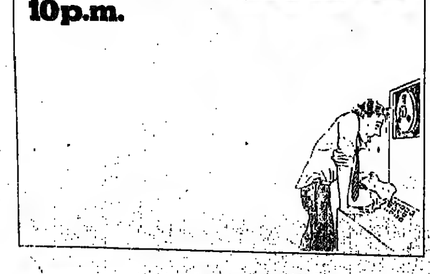
OCTOBER 13
Cleaning maintenance problems seminar. National Computer Complex Cleaning Committee, Piccadilly Hotel, Manchester. Details; CCCC, tel: 01-407 2304.

OCTOBER 18
Forum, 'is personal computing relevant to the DP industry'. IDPM, Central London branch. Imperial Hotel, Russell Square, London WC1. 18.00.

OCTOBER 18-18
The computer revolution, conference. IMechE/BCS. Institution of Mechanical Engineers, Birdcage Walk, London SW1.

OCTOBER 23-25
Mini and micro forum. Online, Brighton.





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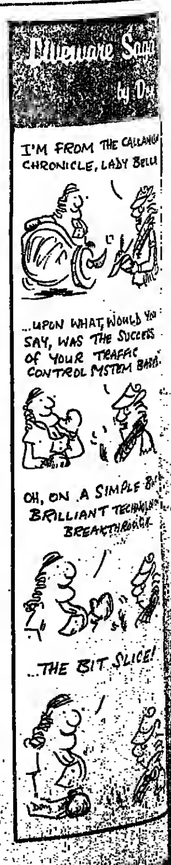

Aggressive moves likely from IBM

AGGRESSIVELY competitive moves by IBM, such as substantial price cuts and defensive product designs, now seem more likely, following the directed verdict in favour of IBM in the Memorex anti-trust case. This is the view of Wall Street financial analysts, Gideon Gartner, of Oppenheimer and Co.

According to Gartner, the verdict is "murder" for the other cases in which companies are challenging IBM because virtually all IBM's arguments in the Memorex case were adopted by the court. In addition, the attorneys in the government's case against IBM must be "substantially distressed" by the verdict, even though it is not binding, because many of the issues in the Memorex case parallel the government litigation.

Gartner points out that Judge Samuel Conti found all IBM's acts to be legal responses to competition. The Judge found no relevant market in general purpose computer systems and held minicomputers to be a relevant alternative. In addition, he ruled that the markets for plug-compatible disc equipment were irrelevant, holding that tape or memory were reasonable alternatives and even that competition for IBM exists, albeit indirectly, from non-IBM compatible products.

Gartner says that the Judge saw the data processing industry as possessing none of the classic characteristics of monopolisation. The Judge ruled that the computer industry was extremely competitive and that IBM was forced to reduce prices to prevent itself being squeezed out of the market, a market characterised by ease of entry and innovation.

On the subject of pricing, the Judge said that IBM could not gain from a strategy of sacrificing present profits to obtain supranormal profits in the future.

Gartner believes that Judge Conti covered his tracks carefully to minimise the chance of an appeal or reversal of his verdict. He granted the directed verdict on five independent counts — markets, monopoly, pricing, damages (ruling that there was no basis for them) and IBM's competitive acts — so that even if IBM were to be nailed on, for example, relevant market, it would be vindicated on monopoly power, and so, forth.

Hopeful report on Honeywell upturn

A CAUTIOUSLY optimistic report on Honeywell has been published by the investment research department of New York brokers Blyth Eastman Dillon, identifying the key current strengths of the computer division as the Level 6 minicomputer line and the Level 66 large-scale mainframe.

The report notes that Honeywell Information Systems' return on both sales and assets remains the lowest of the major US mainframers, but expresses the belief that the strong advance last year would continue.

The report finds the outlook beyond 1979 uncertain and makes no projections; it does not go into Honeywell's plans to introduce a new top-end mainframe line to succeed Level 66 in the early 1980s.

Honeywell's plans for the next generation are anyway not yet finalised, but are currently evolving around a new operating system which, while broadly compatible with GCOS, takes in the best features of both GCOS and the new CP-6 operating system being developed from the Xerox CP-V system (CW, May 25).

The report attributes Honeywell's recovery primarily to an abandonment of its policy of emphasising market share at the expense of profitability. It dates the policy change from 1974, and notes that since then it has reduced employment by 10,000 people, ceded its disc manufacturing capability to Control Data in return for a 30% stake in the merged Magnetic Peripherals Inc company, developed the all-new Level 6 mini line, and centralised product planning in Minneapolis.

The report notes approvingly that Honeywell has so far declined to enter the small business computer market on the grounds that it is not sufficiently profitable, but fails to mention that the company is entering the market in the most risk-free manner possible — by selling low-cost OEM minicomputers to business systems builders.

Honeywell's continuing low return is underlined by a table which shows that in 1977, Honeywell's return on turnover was 7.6% and on assets 8.4%, compared with 30% and 40.3% for IBM; 21.7% and 18% for Burroughs; 16.1% and 12.5% for Univac; and 12.4% and 14.8% for NCR.

For better forecasting

IMPROVED financial planning and forecasting as well as better budget control for local authorities is the aim of a computer system being developed cooperatively by ICL and Oxfordshire County council, with Department of Environment support.

Called the Local Authority Financial Information System, it is being designed for operation on the ICL 2900 series and will come in easily manageable subsets that allow gradual implementation.

Development is already under way in Oxford, where a team of council officers drawn from financial, computer, manpower, and audit fields are defining parameters for the system. A project review committee has been set up to monitor progress and among those represented on this are the Local Authorities Management Services and Computer Committee, and the Chartered Institute of Public Finance and Accountancy.

Applications of the Lafis system will include payroll, credit, income and loans, and information generated by these packages will enable Lafis to produce information for financial forecasting, budgeting monitoring and accounting.

Overall design of the system and a study of its feasibility will be completed by mid-1979, and writing and testing of the system will take place later that year.

Apart from local authority applications, it is likely that Lafis will be promoted for wider financial applications in the UK and overseas.

Faster Series 21 addition

ADDING to its Series 21 family of distributed data processing systems at the top end, MDS has introduced the System 21/50, which has twice the speed and capacity of the existing models.

The System 21/50 can have up to four display stations and can handle up to three concurrent interactive tasks along with a job like batch communication or media conversion.

The microprocessor-based central processing unit of the System 21/50 is twice as fast as the CPU of the existing System 21/20 or System 21/40, but it can execute any programs written for System 21/40 in the Cobol-like Mohawk Business-Oriented Language, Mobol.

The System 21/50 main memory can be expanded from 64K bytes to 128K bytes, twice the maximum on the 21/40, and 21/50 peripherals can include up to four diskette drives and a 20 Mega byte fixed hard disc unit.

Racal wins ninth Queen's Award

THE ninth Queen's Award to be won by the Racal Group in as many years was presented by the Lord Lieutenant of Berkshire, Colonel the Honourable Gordon Palmer, to Ernest Harrison, chairman and MD of the Racal Electronics Group.

The award, for Technological Achievement, was made to Racal-Dana Instruments for the 9060 series of programmable synthesised signal generators, developed in partnership with the Ministry of Defence.

The devices are designed to be incorporated into automatic test equipment systems used for maintenance of the Army's Clansman combat radio communications equipment.

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ICI ORGANICS DIVISION	ICI ORGANICS DIVISION
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OP SPOT

By Bernard Allen

Thorough involvement at London Univac site

MEMBERS of DP management who are unaware of what operators can achieve with the right training and encouragement, should be taken on a guided tour of Univac's benchmark centre in West London.

The operations staff of the centre play a vital part in both pre-sales and post-sales support. To that end, they work closely with systems and programming personnel, and visit user sites throughout the US, Europe, and the UK to provide technical support and staff training.

"The priority of the centre is to support pre-sales activity," said Barrie Johnson, operations manager. And the work also involves monitoring and tuning the performance of applications, using the site's Univac 1100/12 1108 systems.

Shift leader Ku Shamar. Concerning the function of the operators at the site, he says, "I think we must be unique."

He continued, "A customer or potential customer will draw up benchmark specifications and say to the salesman, 'take this software package and give me this level of performance'."

An established user might wish to enhance his system by adding, for example, DMS 1100, the Database Management System.

A potential user will want to see what the 1100 systems are capable of and so he will submit one or more of his applications, such as a payroll, for benchmarking. It will be converted by the software support team, using the 1100/12.

Drawing upon his knowledge of the 1100 systems, and bearing in mind the computing needs of the potential user, the systems analyst will specify how the 1100/12 is to be "tailored" for each benchmark run. That is, which of the system's resources are to be used.

A meeting is held to "kick-off" each project and one of the operators will be involved right from the very beginning.

Ku Shamar, shift leader, said, "I think we must be unique because the operators give the rest of the team a lot of support throughout the whole benchmark process." For each run the operator simulates the user's environment as closely as possible; he switches in the correct number of peripherals and amount of main storage, and then loads the required level of the operating system, 1100 OS. (This will already have been tested on the 1100/12.)

Said Shamar, "The benchmarks are done on the 1100/12. At the end of each shot (some of which have taken as long as eight hours) the operator makes out a progress report. A copy is given to the shift leader for scheduling purposes."

Jila Niktalab clone at the console of the 1106 system, which is used for software qualification and application conversion.

On certain occasions the operators make use of the Performance Display system, a hardware monitor which shows, in graphics, how much of the system's resources the application uses. The PDS data may be projected on to a large screen so that several people can view it together.

The operators are also involved in providing demonstrations of the company's UTS 400 and UTS 700 terminal systems. Using the 1100/08 as a front end for the 1100/12, they run a software package to simulate a network with 200 or so terminals.

"Another involves linking a terminal to one of the systems in order to demonstrate error recovery procedures. It is a resilience demonstration, and it shows how a terminal may be switched between the two systems without affecting the service to the customer," said Shamar.

The operators are given the opportunity to concentrate on the application of their choice. Operator 2, Jila Niktalab, told me. "Some are encouraged to specialise on particular applications, such as the communications network," she said.

Reflecting on the standard of the operations staff at the site, she continued: "I have five years' operations experience; three of these were spent at the Polytechnic of Central London on an ICL 1902A.

"Now, I was often in charge of a whole shift at the Poly, but when I came here I was completely lost. I went back to being a trainee. It wasn't due to the fact that I had moved on to different systems, but rather because the standard here is so much higher."

In a like vein Terry Holtz, on operator 2, said:

"The operators know about all the hardware in the building. We also write operating instructions for the terminals, and small programs for the use of operations."

As part of their post-sales involvement, the operators visit the sites of users. In this regard Jila Niktalab said: "I went to Lufthansa's site in Frankfurt, where they have an 1100/80. What surprised me was the standard of the operations staff — all they seemed interested in finding out was the commands you use in response to system requests, and not the reasons for using them."

Deep in thought at the console of the 1100/12 system are senior operators Rick Spence, and Terry Holtz.

She continued: "Barry Johnson likes to keep a balance between post-sales and pre-sales work. He tries to make sure the operations staff aren't too overworked."

Senior operator Rick Spence is another of the staff who have been to the site of West German airline, Lufthansa. He said:

"The 1100/80 at Lufthansa is used to support an online ticket information system. I went last April and three of the others were there in December."

Referring to career progression at the site, he continued, "I haven't really decided which area I would like to move into. At one time I liked the idea of engineering, but now software appeals more to me."

According to Terry Holtz, "The operators are at the site about a year before they become involved in post-sales work," and two of the staff who have not yet qualified are operators Is Dave Wager and Andrew Bailey. Both attended operations courses under the Manpower Service Commission's training opportunities scheme, TOPS.

Dave, who attended the TOPS course run by Control Data Institute (Op Spot, CW, September 14), has been at the site for six months. He said:

"On the TOPS course we covered ICL and IBM hardware and software, plus some basic concepts. It was useful because it gave me an understanding of the operating system before I joined this installation.

"Here, I am still going through the training process. My shift leader has a training calendar and so far the topics I have covered include hardware, taking into account fault diagnosis, communications, program corruption and file types."

Andrew Bailey attended a TOPS course held at the Borehamwood College of Further Education, Hertfordshire. He said:

"Much of my TOPS course was centred around the ICL 2900 Series. Also, shift leaders came along to give us lectures and we spent three weeks on various installations.

"I have been here for about two months and have a good idea of what is going on. The whole shift knows my training prospectus, and they all pitch in to help me."

Andrew Bailey: "The whole shift knows my training prospectus and they all pitch in to help me."

In a busy environment, Dave Wager (left) gets some on-the-spot training from Tony Foll, another of the site's Operator 2s.

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SURVEY ANALYSIS PACKAGES

Getting an accurate result from survey data

IT seems almost inevitable that any form of human activity will eventually attract the attention of the pollsters. The results of their work can provide a useful guide to market trends, changes in fashion, or shifts in opinion. Politicians delight in quoting the data gathered by such means if it is favourable to their cause, and of denigrating it if it highlights the holes in their policies.

The political poll has brought a certain amount of discredit to this science, but surveys, when properly devised and effectively analysed, provide information that can be vital to the development of modern society.

When surveys are concerned with the human population then it is doubly important that the sampling methods are carefully constructed and that the results are tested and re-tested.

This is an area in which considerable time and money has been expended in developing packages and there are now nearly 80 available to handle various types of survey analyses. The list presented here updates two earlier versions[1,2] and has been prepared by Beverley Rowe, head of the London Polytechnics Computer Unit and chairman of the Study Group on Computers in Survey Analysis, and John Hall, director of the Survey Research Unit and chairman of the UK SPSS User Group. Both are at the Polytechnic of North London.

Last year Beverley Rowe outlined some of the factors that have to be taken into account when designing such survey analysis packages (CW, November 3, 1977). That article summarised a much fuller report, published in 1976[3], which was based on 82 packages and systems. Now there are 77, with 24 additions and nine deaths. The additions are mostly designed for data arising from research in academic institutions or public authorities, and many originate from outside the UK. This present listing does not include detailed comparisons, but a few general points can be made.

Previously the packages were fairly evenly split in their orientation between academic and commercial research (45 per cent: 42 per cent) but now 48 per cent are academic and only 32 per cent commercial with public authorities coming up to 13 per cent. Of the earlier set, 59 per cent were in Fortran (some mixed with assembler). The proportion now is even higher (68 per cent). There is no evidence here that Fortran is dying.

The hardware distribution is very similar, with 360/370 systems still holding first place at over 40 per cent, and although ICL 1900 still stands second it drops back from 40 per cent to 32 per cent.

It has been clear for some time that just making lists is not enough; evaluation is needed. Unfortunately, software evaluation is difficult. There are few guidelines on how to do it and, in this field at least, a pitiful output so far in substantial studies. However, there seems to be a general girding up of loins by the world's statistical associations.

The American Statistical Association has a very active evaluation program under Ivor Francis, of Cornell University, who is also chairman of the International Association for Statistical Computing. The Royal Statistical Society in the UK is keen to establish a project, and the Study Group on Computers in Survey Analysis (SGCSA), which collected the material presented here, is preparing a major proposal for a project.

Important studies have also been undertaken in Germany, France and New Zealand, among others'.

The SGCSA hopes to carry out three surveys, one of software sponsors, one of site implementers, and one of users. The first would provide a database similar to that published by Rowe and Scheer[4]. The implementer survey is intended to uncover the technical robustness of the packages; their portability, technical documentation and reliability in particular. The survey of users is intended to establish how easy or difficult the package is in handling real data analysis.

● Any readers who know of other items of software that they think should be included, should contact Rowe or Hall at the London Polytechnics Computer Unit, Polytechnic of North London, Holloway, London N7 8DR.

REFERENCES

1. John Hall, Beverley Rowe and Anthony Cowling. Computer Software for Survey Analysis, Social Science Research Council Newsletter 20, 1973 (with update in Newsletter 25, 1974).
2. Beverley Rowe, John Hall and Marianna Scheer. Computer Software for Survey Analysis, Social Science Research Council Newsletter 29, 1975.
3. Beverley Rowe and Marianna Scheer. Computer Software for Social Science Data, Social Science Research Council, 1976.
4. Ivor Francis, The statistical profession and the quality of statistical software, Bulletin of the International Statistical Institute, 43, 1977.

The abbreviations under the Function head in the table mean:
M; data management (file formation, data checking, etc);
T, tabulation facility;
D; descriptive statistics (means, standard deviations, etc);
A; analytical statistics (regression, etc).

Name	Function	Language	Hardware	Information from	Comments
AGB BURVEY PROGRAM	MTD	Assembler	Honeywell 200/2000	AGB	General data control and survey analysis: weighting, scaling, quantiles, family items. Designed for large surveys and complex analysis.
ANOVAR	MA	PL/I	IBM 360/370	Newcastle University	Analysis of variance and co-variance. Originated at University of British Columbia.
ARCHIVE	M	Fortran Macro 10 BCPL	DECsystem 10	Survey Archive	A suite of programs for operating on magnetic tape and multipunched cards in a wide range of formats.
ASCOP	MTDA	Fortran Assembler	ICL 1900 Univac 1100	ICL Dataskil (BEC)	Integrated system with command language. Wide range of data editing and statistical operations.
ASP	MTD	Algol 60	ICL 1900, System 4	MRC	Algol Survey Program. A general package with user requirements specified in Algol.
BATCHSTAT	MTDA	Fortran Assembler	Univac 1100	Scicon	General multi-variate analysis, stepwise and optimal regression, cluster analysis, maximum likelihood, factor analysis, principal components, etc. Can create databanks and a version of ISAP can analyse these.
BBC	MTD	Fortran Assembler	ICL 1900	BBC	Suite of interrelated programs. Intermediate magnetic tape storage. Runs in 13K core.
BMD/BMDP	MTDA	Fortran Assembler	CDC 6000/7600 IBM 360/370 ICL 1900, 2900 Univac 1108	ULCC Newcastle University NAG PLU UCC	Large collection of general data management and statistical programs. (ICL 1900 version is a subset of BMD only.)
BUG	M	Fortran	IBM 360/370	GLC	Editing package working on SPSS-compatible data definitions: range and consistency checks, Fortran commands.
CHECK	M	Fortran	ICL 1903A	Oxford University	Wild code and consistency checking.
CIRAB	MTD	Cobol	IBM 360/370 ICL 1900 System 4	LAMSAC	Census Information Retrieval and Analysis System. Specifically for the 1971 census enumeration district summary information produced by DFCS.
CLUSTAN	A	Fortran	CDC 6000/7900 IBM 360/370 ICL 1900	Cluston	Collection of cluster analysis methods: hierarchical, agglomerative, monothetic division, iterative reallocation, BK and mode analysis. Optional graphical output.
CLUSTER	MT	Cobol	IBM 360/370 ICL 1900, System 4	LAMSAC	For local authorities to create, maintain and analyse land use and employment files.
COCENTB	T	Cobol	Most	Bureau of the Census	Suite of programs to produce tabulations from census and survey data.
COHORT	A	Fortran	Most	Wootton, Joffreys	Forecasts populations in five year periods using census data.
COI	MTDA	Fortran	COC 8000	National Children's Bureau	Up to 300 cards per case, any pattern of punches. Efficient tape-packing for large surveys. Wide range of checks and transformations.
CUMULUS	MTDA	Assembler	IBM 360/370	Gallup	General survey package with dictionary and text files.
DAS	MTDA	Fortran Assembler	ICL 2980/70/90	ICL Dataskil (BEC)	Subsystems for statistics (including hierarchical data), forecasting and matrix handling, each with extensive data management, may be used separately or combined.
DATABLE	MTD	Fortran	Univac 1109	Cluniss-Ross	Flexible table layout from multi-punched data. Analysis of interviewer effects. User routines for mapping mixed data formats or special tabulation requirements.
DATA CLEAN	M	Fortran Assembler	IBM 360 ICL 4130	Stirling University	Checks that survey data conforms to user-supplied rules. Data must be unsigned integers and/or alphanumeric.
DATAVET	D	Fortran	ICL 1900	Birmingham University	Validates survey data according to user-supplied rules. SPSS-like control instructions and data forms. Integer, decimal and alphanumeric data allowed. Runs in 15K of core.
DONOVAN	MTD	Assembler	IBM 1130, 360/370	Donovan	A versatile and efficient general survey system. Used by a number of market research firms.
DRB TAB	MTDA	Fortran Assembler	PDP 15	DRB	Logical edit, weighting, filtering on binary (multi-punched) data, and large numeric fields, positive and negative counts, inter-table arithmetic and statistics, sparse matrix routines, origin/destination analyses, large volume, multi-card and hierarchical data sets.

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SURVEY ANALYSIS PACKAGES

Name	Function	Language	Hardware	Information from	Comments
DUSTPAN	MT	Fortran	ICL 4130	Dundee University	Detects features of data that may dictate appropriate further analysis using a front-end called PROBE. Includes a limited range of statistical analysis.
EASYTAB	MTD	Fortran Assembler	IBM 390/370	Libra	Versatile, flexible and easy-to-use tabulation program. User needs no experience. Handles multipunched data.
ECTA	A	Fortran	ICL 1906A	Oxford U	Log-linear models for contingency tables.
FACCOM	A	Fortran	CDC 6600/7600	LSE	Principal component and factor analysis.
FAKAD	MTDA	Fortran	DEC 10 IBM 390 System 4	Nuffield (KM)	Interactive general data management and statistical analysis.
FILAN	MTDA	Fortran Assembler	ICL 1900	ICL Dataskil (TALD)	High level language, uses disc as core extension. Handles massive data files and hierarchical records. Needs 64K.
FILETAB	MT	Assembler	Most	NCC	Complete file management package with very flexible report format specifications and subsidiary input/output file processing described by decision tables. Handles up to 14 files.
GENSTAT	MTDA	Fortran	Most	Rothamsted (JN)	Language for data manipulation and multi-stage statistical analysis. Analysis of balanced and unbalanced experiments, regression, fitting generalised linear models, multi-variate and cluster analysis, data storage and retrieval.
GLIM	MDA	Fortran	Most	NAG	General Linear Interactive Model. Interactive command language permits general data manipulation, program control and model fitting for ANOVA, contingency tables, proportions, etc.
GUMMA	A	Fortran	CDC 6600 IBM 390 ICL 1900, 4130	Institute of Education	Uni-variate and multi-variate analysis of variance and co-variance and regression, canonical variates and discriminant analysis, maximum likelihood factor analysis.
HOLE	M	Fortran	CDC 6500	LUCS	Performs hole counts on data with a variable number of cards per case.
IMSL	MTDA	Fortran	CDC 6500	LUCS	International Mathematics and Statistics Library. Suite of general statistical subroutines. Originates from IMSL Inc.
INTERSTAT	MTDA	Fortran Assembler	Univac 1108	Scicon	Provides standard econometric and time series statistics interactively, eg regression, Shiskin type de-seasonalisation, correlation functions, curve fitting, transformations and editing features.
ISAP	MTDA	Fortran	Univac 1108	Scicon	Interactive Survey Analysis Package. English language instructions. Versatile and flexible. Batch or interactive.
LIBRA 5	MTD	Fortran Assembler	IBM 390/370	Libra	General survey analysis suite. Handles multi-punched data with free-format user specification. Scaling, weighting, tabulation. Complex variable transformations.
MDSA	MTDA	Assembler	ICL 1900	Newcastle	Extends facilities of the two ICL survey packages (FILAN and XDSE) by providing links to XDS2/3.
MESH	MTDA	Fortran Assembler	Sigma	CRC	Media Evaluation and Schedule Handling. For media ranking listings and all combinations using binomial expansion.
MIDAS	MTDA	Fortran Assembler	IBM 360/370	Newcastle University	Michigan Interactive Data Analysis System. Developed at University of Michigan. Large number of data management and statistical programs including time series processing.
MULTIPROG	MD	Fortran Assembler	Sigma	CRC	Set of programs for listing and transferring survey data between different computers.
MUTOS	M	Fortran Assembler	CDC 6600/7600	LSE	Unscrambles multi-punched data.
MVA	TDA	Fortran	ICL 1906A.	Nuffield (KH)	Canonical, discriminant, regression and principle component analysis, orthogonal and non-orthogonal analysis of variance, numerical taxonomy.
MVSL	MTDA	Spectel	CDC 6600	LUCS	General survey package.
NESSA	MTDA	Fortran Assembler	IBM 1130, 390/370	Nestlé	Package of market research editing, tabulating and statistical programs.
OSIRIS	MTDA	Fortran Assembler	IBM 360/370	Survey Archive	Large number of data management and statistical programs. Originates from Institute for Social Research, Ann Arbor, Michigan. Includes MCA for cluster analysis and AID for stepwise regression.
PACKAGE X	MTDA	Fortran Assembler	ICL 1900	CSO	A system for the management and analysis of statistical data. It can be used in conversational, command-interactive or batch modes. Communication is chiefly in English.
PANAMA	MTDA	Assembler	Univac 1108	UCC	General survey analysis package. Data from any source, validation, weighting (self-calculating), filtering, tabulation. Extensive recoding and matrix manipulation.
PCLP	MTDA	Fortran	CDC 6000	LSHTM	Suite of programs. Multi-way tables of means and counts. Specification by free-format statements reflecting structure of problem.
PERSEE	MTD	Assembler	Univac 1108	UCC, Scicon	General survey package.

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The right contact for more details

More information about the packages listed in this supplement can be had from the various organisations given below.

AGB: General Manager, AGB Computer Services, Audit House, Eastcote, Ruislip, Middlesex HA4 9LT.
BBC: Burt Narain, Statistical and Computing Systems Section, BBC Audience Research, The Langham, Portland Place, London W1.
Birmingham University: Trevor Lambert, Computer Centre, University of Birmingham, PO Box 363, Birmingham B15 2TT.
BOC-Datasolve: Survey Analysis Manager, BOC Datasolve Ltd, 14 Old Park Lane, London W1Y 4NL.
Bureau of the Census: International Statistical Programs Center, US Bureau of the Census, Washington DC 20233, USA.
Clunies-Ross: Charles Clunies-Ross, 49 Norland Square, London W11 4PZ.
Clustan: Clustan Project, 16 Kingsburgh Road, Edinburgh 12.
Comshare: Comshare, 32-34 Great Peter Street, London SW1P 2OB.
CRC: Managing Director, Cybernetics Research Consultants Ltd, 83 Clerkenwell Road, London EC1R 5HP.
CSO: Vincent Dunleavy, Central Statistical Office, Great George Street, London SW1.
Denjon: Sydney-Paul Johnson, Denjon Marketing and Computers Ltd, 33 Henrietta Street, London WC2E 8NA.
Donovan: Donovan Data Systems, 666 Fifth Avenue, New York NY, USA.
DRS: Technical Director, DRS Data and Research Services Ltd, 16 Burners Lane, Kiln Farm, Milton Keynes, MK11 3AK.
Dundee University: Professor Sprent, University of Dundee, Dundee.
Essex University: Economics Department, University of Essex, Wivenhoe Park, Colchester, Essex CO4 3SQ.
Gallup: OP Manager, Social Surveys (Gallup Poll) Ltd, 202 Finchley Road, London NW1 6BL.
GLC: I. F. Rickard, Central Computer Services, Greater London Council, County Hall, London SE1 7PB.

● Turn to page 15

● From page 14

Hampshire CC: Deputy DP Manager, Hampshire County Council, The Castle, Winchester.
IBM Call Centre: Call Marketing Manager, Call Centre, IBM (UK) Ltd, PO Box 218, 40 Basinghall Street, London EC2P 2DY.
ICL Dataskil: Advanced Systems Division, Scientific and Systems Program Department, ICL Dataskil Ltd, Reading Bridge House, Reading RG1 8PN.
Ingleby: J. O. Ingleby, SPS Committee, Free School Lane, Cambridge CB2 3RP.
Institute of Education: Computer Centre, Institute of Education, University of London, Malet Street, London WC1.
LAMSAC: The Director, LAMSAC, 3 Buckingham Gate, London SW1E 6JH.
Libra: Vernon Thompson, Libra Computing Ltd, 29-30 Brook Mews North, London W2 3BW.
LSE: Manager, Computer Services Unit, London School of Economics and Political Science, Houghton Street, London WC2A 2AE.
LSHTM: Program Librarian, Department of Medical Statistical and Epidemiology, London School of Hygiene and Tropical Medicine, Keppel Street (Gower Street), London WC1E 7HT.
LUCS: Marketing Manager, London United Computing Services Ltd, 38 Gordon Square, London WC1H 0PD.
MRC: I. D. Hill, Division of Medical Computing, Clinical Research Centre, Medical Research Council, Watford Road, Harrow, Middlesex HA1 3UJ.
NAG: NAG Central Office, 7 Banbury Road, Oxford OX2 6NN.
National Children's Bureau: Bob Wellburn, National Children's Bureau, 8 Wakley Street, London EC1V 7QE.
NCC: Information Operations Centre, National Computing Centre Ltd, Oxford Road, Manchester M1 7ED.
Nestlé: Roy King, Market Research Department, The Nestlé Co Ltd, St George's House, Croydon CR9 1NR.
Newcastle: D. L. Mothersole, City Treasurer's Dept, Newcastle-upon-Tyne MDC, Civic Centre, Newcastle-upon-Tyne.
Newcastle University: Information Officer, Computing Laboratory, Claremont Tower, Claremont Road, Newcastle-upon-Tyne, NE1 7RU.
Nottingham University: M. B. Youngman, School of Education, University of Nottingham, University Park, Nottingham NG7 2RD.
Nuffield: Research Services Unit, Nuffield College, Oxford, OX1 1NF.
OPCS: Technical Library, OPCS, Titchfield, PO15 5RR.
Oxford University: Clive Payne, Computer Unit, Social Science Faculty, Nuffield College, Oxford OX1 1NF.
PLU: Program Library Unit, Edinburgh Regional Computer Centre, 18 Buccleuch Place, Edinburgh EH8 9LN.
Pritchard, Brown and Taylor: Jeremy Pritchard, Pritchard, Brown and Taylor Ltd, 87 Charlotte Street, London W1P 1LB.
P-STAT: P-STAT, Princeton University Computer Centre, 87 Prospect Avenue, Princeton, New Jersey, 08540, USA.
Rothamsted: RGSP Secretariat, Dr J. A. Nelder, Statistics Department, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.
SAS Inst: SAS Institute Inc, Raleigh, North Carolina 27605, USA.
Scicon: Scientific Control Systems Ltd, Brick Close, Kiln Farm, Milton Keynes MK11 3EJ.
SIA: Service in Informatics and Analysis Ltd, Ebury Gate, 23 Lower Belgrave Street, London SW1N 0NW.
Stirling University: Richard Bland, Department of Sociology, University of Stirling, Stirling.
Survey Archive: The Director, SSRC Survey Archive, University of Essex, Colchester CO4 3SQ.
UCC: Sales Executive, United Computing Company (GB) Ltd, 344-350 Euston Road, London NW1 3BJ.
ULCC: User Support Department, University of London Computer Centre, 20 Guildford Street, London WC1.
Ulster College: Computer Manager, Ulster College, Northern Ireland Polytechnic, Jordanstown, Newtownabbey, W. Antrim BT37 0QB.
Wootton, Jeffreys: Wootton, Jeffreys and Partners, Cemetery Pales, Brookwood, Woking, Surrey GU1 0BL.

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SURVEY ANALYSIS PACKAGES

Name	Function	Language	Hardware	Information from	Comments
PMMD	MTDA	Fortran	Most	Nottingham University	Fifteen programs for data management, tabulation and statistical analysis. Includes correlation, ANOVA, multiple regression, factor, discriminant, cluster and item analysis. Comprehensive facilities for subgroup analysis.
PS11/PS12	MTDA	Fortran Assembler	ICL 1900	Ulster College	PS11 validates survey records and their definition and outputs this information to a magnetic tape. PS12 reads PS11 tape and carries out various tabular, descriptive and statistical analyses as required.
PSST	MTDA	Fortran	CDC 6400/7600	Ingleby	Package of Simple Statistical Tests in which the choice of appropriate test is made by the program.
P-STAT	MTDA	Fortran	Most	P-STAT	Large general social science statistical system. Good data cleaning and file manipulation: sort, collate, match, etc.
QUANTUM	MTDA	Assembler	IBM 390/370	Denjon	Generalised tabulation package with flexible editing, input/output, labelling, filtering, weighting, with ability to handle multi-punched cards and complex data structures. Retains control and context information.
RGSP	MTDA	Fortran	CDC 6000/7600 IBM 390/370 System 4	Rothamsted (RGSP)	Rothamsted General Survey Program. Allows multi-punched and hierarchical data; good validation. Powerful table manipulation and flexible, compact and well annotated table print. Allows files of tables. Interfaces to GENSTAT and GLIM.
SABLE	MTDA	Assembler	ICL 1900 Honeywell 716	Pritchard, Brown and Taylor	Comprehensive survey analysis package. Program generative techniques improve efficiency. Edit, re-code, hole-count, data handling and fully-headed, flexible-format tables.
SAS	MTDA	Fortran	Amdahl 470 IBM 390/370 Itel AS/4, AS/5	SAS Institute	Total system for data analysis: data management, report writing, and statistical analysis. Cross-tabulation, correlation, plotting, general linear models, cluster analysis, discriminant analysis, factor analysis, matrix handling, tests.
SPAM	TD	Assembler	IBM 390/370	BOC Datasolve	Media and market research analysis system.
SPS	MTDA	Fortran Assembler	Sigma	CRC	Survey Processing System. Free-format language with full analysis and data editing facilities. Comprehensive statistics and weighting facilities. Batch or conversational.
SPSS/SCSS	MTDA	Fortran	Most	See comments (right)	Statistical Package for the Social Sciences. Most used package for academic survey analysis in UK. Co-ordinated worldwide by SPSS Inc, University of Chicago.
STS	MT	Cobol	ICL 1909S	OPCS	Suite of programs for counting records, aggregating counts, arranging and printing of results. Designed for very large files, very efficient and flexible.
SURVEY 70/STATPACK	MTDA	Assembler	IBM 390/370	IBM Call Centre	Interactive uni-variate or multi-variate statistical routines including edit, transformation, correlation, analysis of variance, regression, discriminant analysis, rank correlation, factor analysis, exponential smoothing, probit and spectral analysis.
TAB	MTD	Fortran	Any	Wootton, Jeffreys	General survey package. Tables up to nine dimensions, dynamic store allocation. Data transformations.
TABOL	T	Assembler	ICL 1905	OPCS	Very efficient and accurate table production program specifically designed for census purposes.
TACTICS	MTDA	Fortran Assembler	Sigma 6	Comshare	An interactive statistical analysis system with a comprehensive range of techniques for survey data validation and analysis, tabulation, multi-variate statistics, forecasting and analysis of experiments.
TAP	MTDA	PL/1	IBM 390/370	Hampshire CC	Tabulation and Analysis Package. Includes editing and data transformation, eight-dimensional tables, matrix manipulation, parametric and non-parametric statistics, histograms, hierarchical keys for data.
TSP	MDA	Fortran	CDC 6000/7000 DEC 10	LSE Essex Univ (Ec)	Time Series Processor.
VERIFY/MODIFY	M	Fortran Assembler	CDC 6000/7600	LSE	Consistency checks.
WASP	MTD	Fortran	PDP 11	MRC	A general survey package with user requirements specified in Fortran.
XDS 2/3	DA	Assembler	ICL 1900	ICL Dataskil (AS)	General statistical package.
XDSE	MTD	Assembler	ICL 1900	ICL Dataskil (AS)	General survey analysis package. Special provisions for traffic surveys.
XTAB	MTDA	Fortran	CDC 6000	LSHTM	Programs for one- and two-way distributions, histograms, scattergrams, correlation, multiple linear regression.
ZPUSSCAT	T	Assembler	IBM 360/370	GLC	Simple, fast tabulation package: file handling, case selection, counting, totalling.

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Magnetic Media Manufacturing Division

Control Data's Band Printer now produced in Britain

An Invitation to U.K. OEM Suppliers

To join us on one of our open days being held, two sessions per day—morning and afternoon—at our factory in Stevenage on 24th, 25th and 26th October, and to be our guest for lunch.

Please contact us for your official invitation.

Control Data is pleased to announce to the OEM market that it's highly successful 9380 series of band printers is available from its United Kingdom manufacturing subsidiary located at Stevenage, Herts.

These printers utilise the latest band technology to achieve speeds of 300, 600 and 900 l.p.m. with a 64 character print set and incorporate features that provide for a high degree of spares commonality and easy interchangeability of character styles. Also available are 48, 96 and 128 character print sets.

The 300 and 600 l.p.m. versions have the ability to operate at an increased character density of 15 characters per inch as well as 10, resulting in easier forms handling and lower paper usage—approximately 40% saving in paper volume and 30% paper costs.

We are holding a number of open days at our factory in Stevenage to introduce this product family. We would like to extend an invitation to you to join us when you will be able to see the product in its manufacturing environment and to discuss the product and its application to meet your requirements.

A major innovation—the use of an engraved leatherweight steel print band instead of a drum; operator interchangeable within approximately 30 seconds.

CONTROL DATA

To receive an invitation please contact Colin Keighley, OEM Sales Department, Control Data Ltd., 22a St. James's Square, London, S.W.1. Tel. 01-930 7344, ext. 226.

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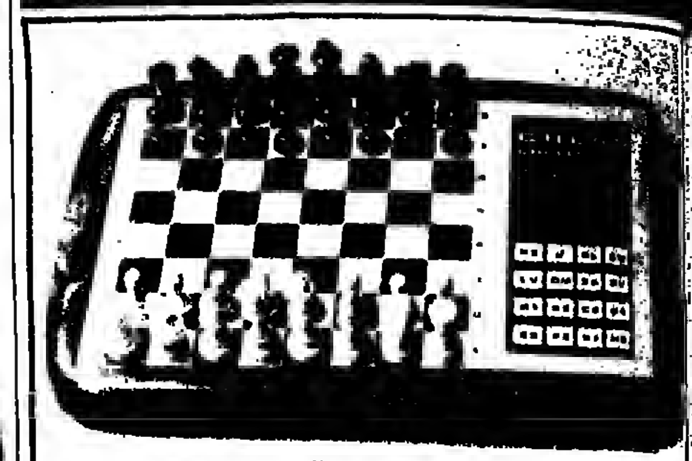
MICRO NEWS—1



Chess Challenger update

A little over a year since it introduced the one-level of play Chess Challenger, Spectrum Marketing of London has begun marketing Chess Challenger 10, a 10-level chess computer.

Based on the Zilog Z80 microprocessor, it is more powerful than the previous system which used an Intel 8080 micro, and offers games ranging from "beginner" in which the average response time is five seconds, to "correspondence" mode which takes 24 hours to run through over 3 million possible board positions before giving a reply.

Various special functions are available such as random response games in which the computer selects different moves despite the same user pieces being moved, and the ability to follow classic book openings such as Sicilian, Ruy Lopez and Queen's Gambit. For the more advanced player, moves such as En Passant and Castling are available.

Presently available exclusively from Harrods until October 1[illegible], Chess Challenger 10 comes in a travelling briefcase and costs £200 — the same price as the original one-level machine.

Fairchild bipolar revival puts shadow on GEC 'marriage'

BIPOLAR semiconductor technology, for some years considered rather passé when compared to MOS, seems set to have a revival. The introduction by Fairchild of a 16K dynamic memory part brings the technology right back into the forefront of mainstream semiconductor developments, with the potential of offering several advantages over MOS, the prevalent memory technology.

The move also passes one small shadow over the recently announced joint ventures operation between Fairchild and GEC (CW, August 17). Several US observers have already suggested that, as the new factory will concentrate on MOS-based products, Fairchild was not the best choice of partner that GEC could have made.

They point out that Fairchild was late into the MOS business, due to excessive concentration on the "older" bipolar technology.

Now, there appears the strong possibility that that concentration may pay off, and in a product area where MOS has been predominant for many years. It is not without irony that the first product scheduled to appear from the GEC-Fairchild plant is to be a 16K MOS memory device.

Known as the 93483, the 16K memory is already being sampled and full production runs are expected to begin during the first quarter of 1979. In common with current MOS 16K parts, the new bipolar device is being mounted in a 16-pin package, and uses a single 5 volt power supply with TTL compatible input and output capabilities.

Unlike MOS however, the access time is being quoted as 120 nanoseconds, and the cycle time, 280 nanoseconds both are faster than comparable MOS parts, and the operating power is said to be generally lower.

To keep the package pin count to 16, the part uses multiplexed addressing, but address decoding is achieved in a somewhat unconventional manner.

Six of the seven addressed in the first level of addressing are decoded to provide word addressing. The seventh address selects one of two groups of 128 bits from the 256 bits of the selected word. The seven address signals of the second level are used to select for reading or writing the desired bit from the previously selected group of 128 bits.

This column and row decoding is accomplished by the unconventional means of a "tree" decoder. Three levels of decoding are stacked, and a switched tree-decode current is steered through a path in the "tree" to a sense amplifier or word driver.

In add to the speed advantage, bipolar devices have several other inherent advantages over MOS. Chip sizes are generally smaller, because the ancillary circuitry is smaller. In fact, Fairchild claims that for a given chip area, a bipolar memory offers more than twice as much memory as MOS.

For the future, the company is predicting access and cycle times to come below 60 and 1[illegible] nanoseconds respectively, and that a 64K bit memory will become available within two years.

Byte Shop opens in Southampton

A NEW branch of the Byte Shop is to open in Southampton [illegible] month and it will be managed by Geoff Lynch, who comes from Xitan Systems of [illegible], Dorset.

It will carry the same products as the first branch in [illegible] which founder Bill Cannings says consists of products from all the major US personal computer manufacturers, and includes the largest selection of personal computer software in the UK.

Latest products include word processing software for [illegible] with printers at less than £[illegible] VDU from Cifer for £[illegible] memory [illegible] low cost add-on [illegible] Apple II and TRS 80 systems.

Future plans are for five shops by the end of this year [illegible] a steady increase to [illegible] end of next year, states [illegible]

Cannings [illegible] problem [illegible] finding [illegible] them [illegible]

MICRO NEWS—2

Edited by Martin Banks

Using DP power to extend capabilities of design is theme

THE Wescon exhibition in Los Angeles, California brought further evidence that the application of computing power is extending ever downward from the dizzy complexity of mainframe data processing, and is meeting the ever growing complexity of semiconductor electronic components moving upwards.

In all areas of the exhibition, except for those examples of passive components such as resistors, capacitors and switches that were on display, there were products on show that in some way made use of computing power to extend the capabilities and performance of the design.

Invariably, these products made use of the microprocessor in some form and, it was noticeable that even though they are still relatively new devices, their application was considered normal and commonplace, rather than novel and esoteric.

Certainly, there was a section given over to the esoteric application, such as the Consensor polling system from Applied Futures Inc and the Mailmobile from Lear Seiglar (CW, September 21) and some of these deserve a long term future.

Unlike many European exhibitions, the Wescon show was used by several companies as the launch pad for new product developments.

Probably the most significant of these came from Rockwell International, with the introduction of its 256K bit bubble memory chip for the volume market (CW, September 21).

Known as the RBM 256, the part is composed of 262 loops, each containing 1,025 bubble positions. It operates with a 260 bit data block, leaving 22 loops unassigned.

Of the assigned loops, 256 are retained for binary data storage, while the remaining four are used for housekeeping. Where the devices are used in parallel, for example, these extra bits can be used to hold block address headers.

Data transfer is at 150 KHz, and the first bit of any block can be accessed in under 4 milliseconds, on average. A replicate/read block architecture is used for data retention during the read cycle, so that bubbles read at the detectors are in fact duplicates of the loop-resident bubbles.

Rockwell is aiming squarely at the OEM and systems market, for not only is it producing the single chip memory, but it is also bringing out a range of standard and custom board systems that, in multiple configurations, can already provide up to 2 Mbytes of store. The first standard board is the RBM 658, providing 1 Mbit of storage.

Applications that its electronic research centre has developed include a spacecraft recorder for Nasa that is designed for 100 million bits capacity. This unit is based on 100K bit memories.

One of the biggest micro-based systems on display at Wescon was the Starplex development system, being launched at the show by National Semiconductor (see picture above).

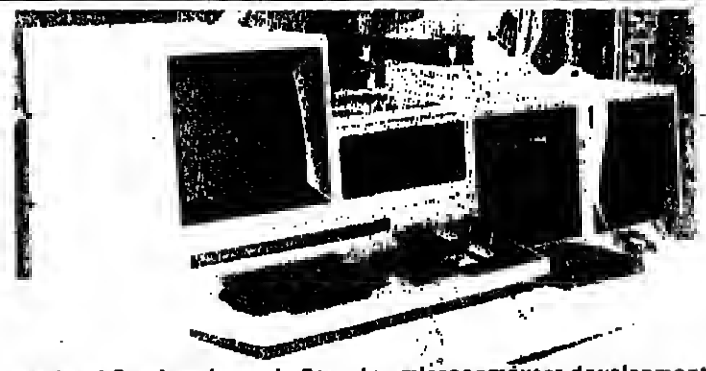
Termed a "pre-integrated" system, it is primarily intended for development work on the company's range of BCL 80 single board computers, upon which the equipment itself is based. The system consists of a range of modular units, from which a variety of configurations can be constructed.

The modules all relate to the processor subsystem, which is based on a BLC 80/240 CPU board. This has a screen controller, floppy disc controller, 64K bytes of shared user memory, and a dual four-slot chassis for system expansion.

Incorporated in the processor subsystem are four keyboards — a normal Ascii, a system function keypad, an editor keypad and a program select keypad. As an option, it can be equipped with a PROM programming station.

Software for the system has been structured into five levels, ranging from the operating system as the lowest executive level, through to user applications programs at the highest level.

In between come operating system services, development services, and man/machine communications. Development services incorporate a macro-assembler, Basic compiler/interpreter, Ansi Fortran IV compiler, and an editor.



National Semiconductor's Starplex microcomputer development system, launched at Wescon, offers a modular approach to system configuration.

Wescon78

Though much of the exhibition was given over to microprocessors, and their applications, the design of the devices was not forgotten, the Applicon was on hand to demonstrate its new Super VLSI Graphics System.

Intended to cope with the rapid growth in device complexity that is expected over the next few years, this system uses three independent processors, integrated at three levels of the system architecture.

Routine I/O functions and computations are handled by a Digital Equipment PDP-11 processor. This is fronted by Applicon's own Graphics 32 machine, a specialised 32 bit minicomputer designed to speed up drawing and command input functions. To control the refresh function for the system's video terminals, a 16-bit microcomputer has been installed.

There were many examples of the small, and not so small, microcomputer systems to be seen at the show, together with samples from the many companies that have sprung up to service this growing market with products and subsystems.

For example, Oliver Advanced Engineering, of Glendale, California were showing a new EPROM duplicator that the company claims surpasses all other units in cost effective EPROM production.

Known as the UPP-2700, it uses a single board construction and LSI circuitry to reduce the downtime associated with "computer" based programmers.

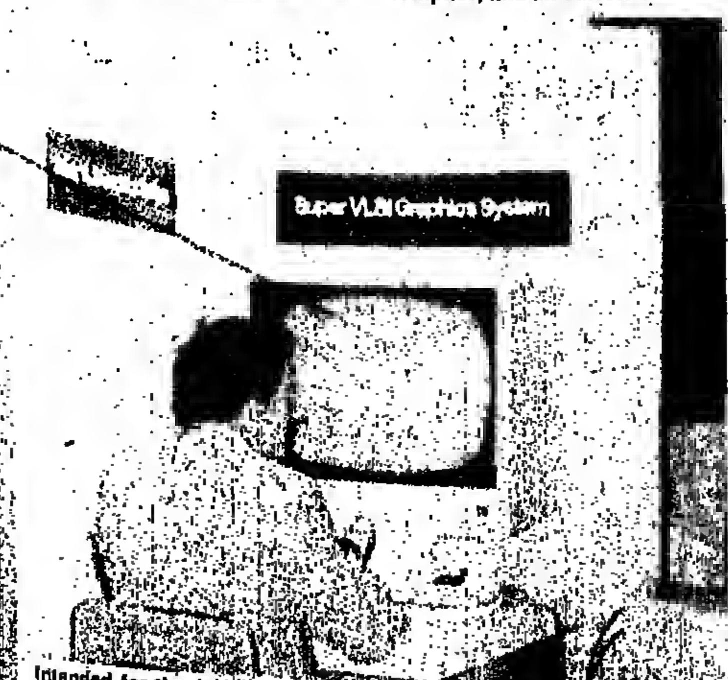
It will duplicate from 1 to 16 EPROMs automatically and is currently capable of programming 2704, 2708, 27L08, TMS 2716, Intel 2758, Intel 2716, TMS 2516, Intel 2732 and TMS 2532 devices.

Cromemco were on hand with their familiar Z2 and Series 3 machines, being demonstrated in a variety of configurations. One of the latest the company has evolved is as a word processor. This has been developed as a software package that can be run on either of the two machines, it being transparent to both.

Jade Computer Products, which has already caused a stir at a recent UK personal computer exhibition, were exhibiting the wide range of microcomputer boards it sells, usually at what are known as "aggressive" prices.

Examples from its catalogue give a good idea of what this means. It is selling an S-100 compatible Z80-based CPU card with provision for a 2708 EPROM and a power on jump facility, at a listed price of $135 in kit form. Assembly and testing is quoted at an extra $50.

For $199.95, it selling the MD 690a CPU board. This 6802-based, S-100 compatible board includes a 1K byte monitor PROM, 1K byte of RAM, 16 I/O ports and a RS 232C interface.



Intended for the design of the coming age of VLSI integrated circuits, Applicon was showing the new Super VLSI Graphics System for computer-aided circuit design.

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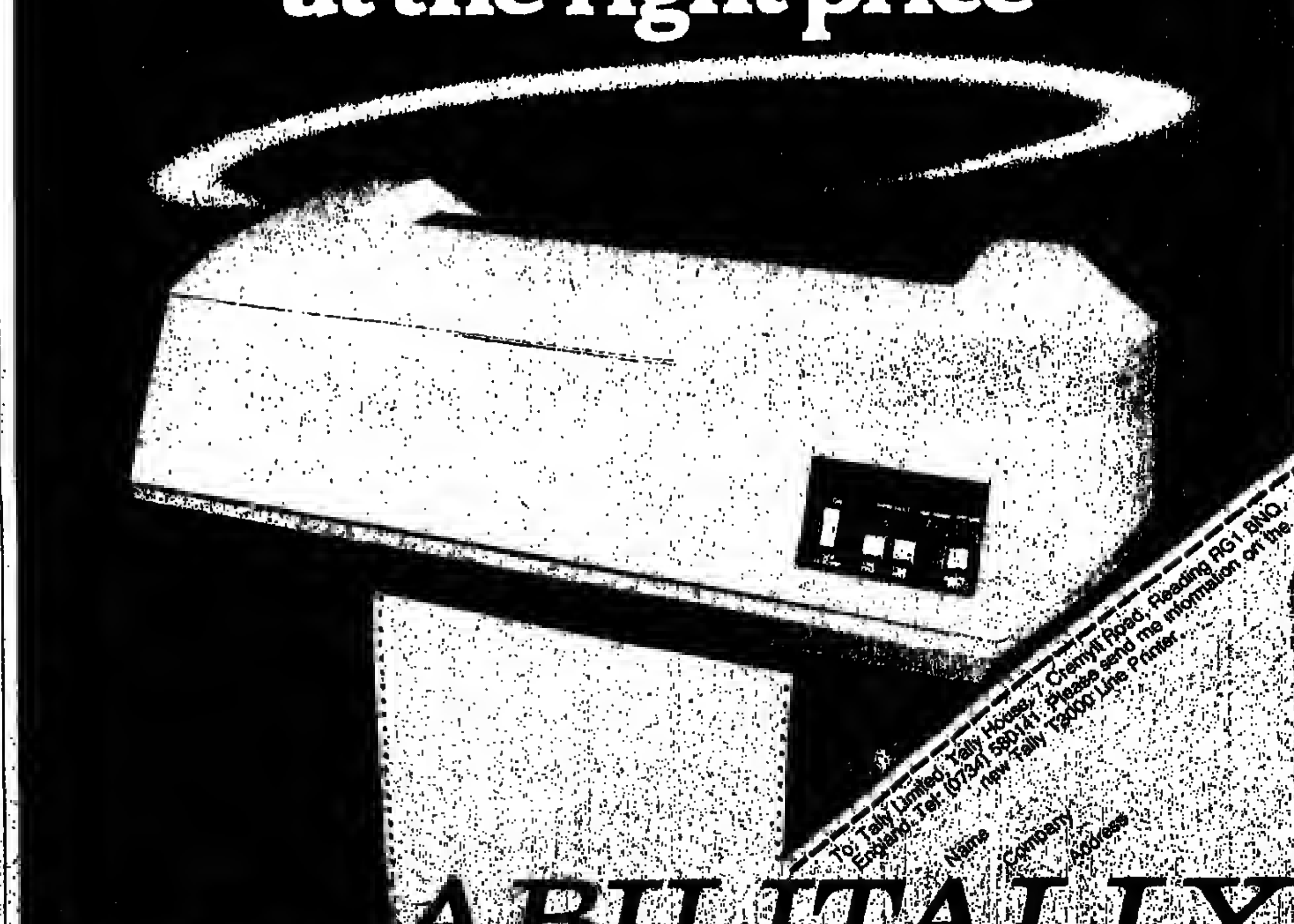

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Rental speciality of bank-backed firm

RENTAL of terminals and word processors is the speciality of a new firm set up by Mike Brooke, formerly of BOC Datasolve, and Gordon Skinner, one time managing director of Interscan. The company, MBS Rentals, is being backed by merchant bankers Keyser Ullman, their first venture into this field.

Brooke's aim is to provide a rental service backed by plenty of expertise to help customers overcome what he calls a "frightening lack of knowledge" among businessmen about this sort of equipment.

Bureaux, Brooke claims, are not very interested in advising their users on what terminals are best for their purposes, and the range of terminals on the market is wide, with over 80 suppliers in the UK at present.

MBS will rent all types of equipment, both hard copy units and VDUs, from the simple to the sophisticated. Only about two or three different word processors will be offered, at least initially, but providing users the opportunity to try out WP without long-term commitment.

The Jacquard machine will probably be MBS' first word processor. Peripherals such as floppy disc and cassette units will also be on hire.

Brooke feels that prices for terminals have now bottomed out, the benefits of microelectronics for them having now been largely realised. Costs are dominated by mechanical hardware such as chassis and tubes, and by distribution.

MBS is based in Byfleet, Surrey.

ICL denies 'bad labour record'

REPORTS that ICL's factory at Winsford, Cheshire, has a poor labour relations record have been denied by the company. The plant assembles and tests 2950 and 2960 systems which, claims ICL, have won considerable export business and all order dates have been met. The only stoppage during the past year was in the summer when some workers walked out because the shopfloor was too hot.

The matter was raised when Richard Prestt, managing director of Bauer (GB), the UK subsidiary of the West Germany engineering group, announced that there would be 200 extra jobs at the Winsford factory. He indicated that he did not want people from ICL and Metal Box, the two biggest employers on the Winsford industrial estate.

Prestt told Computer Weekly that he preferred people from smaller companies because they usually had a better work record. He aimed to achieve production to match that of the Bauer parent company and had made his views about the labour force known to the local Job Centre. He added that there were some former ICL employees at Bauer.

Black Knight outplayed

IT'S been a sad summer for computer chess enthusiasts. First, International Chess Master David Levy won his 10-year bet, that he could beat any computer chess program (CW, September 7). And now Black Knight, run on a Univac 1106 at Teesside Polytechnic, taking on all comers during the EEC Chess Tournament in Middlesbrough (shown here) was outplayed by experts from the UK, Belgium, Germany, Denmark and Luxembourg.

To be fair, Black Knight was not operating in full tournament mode, says Univac, five of whose employees devised the program.

Black Knight searches ahead only a selective set of moves and employs heuristic techniques to anticipate moves beyond those searched. In its game last year against the current US Computer Chess Champion, Chess 4.5, the latter evaluated an estimated two million moves to Black Knight's 10,000. An International Grand Master (human) evaluates about 200 moves. With or without yoga masters, parapsychologists or maintenance engineers.

Extra jobs created by Pet production

AS a result of its decision to begin production of its Pet computer in the UK, Commodore Business Machines is to take on more assembly staff at its factory in Egglescliffe, Cleveland.

About 30 additional workers will be employed by mid-October when CBM estimates it will be producing 1,000 Pets a month. This figure will rise to 2,000 a month by next March.

No manufacturing will be carried out at Egglescliffe, only assembly of US-made components. But some sub-assembly work may be transferred there in the future and this could result in further jobs being created.

Earlier this year, over 100 calculator assembly workers were made redundant when CBM shifted production of its range to the Far East due to changes in the manufacturing process.

● Pay increases ranging from 3.5% to 12.5% backdated to May have been awarded to staff at Ferranti's Bracknell division and an across the board wage increase of 10.5% backdated to J[illegible] 1, has been made to Ferranti's Scottish workforce. Both increases come under fair wage settlements by the Central Arbitration Committee.

PDP-11/34 used in brain damage study

IMPROVED treatment of tumours and brain damage is the aim of a research project starting in Hull in which a PDP-11/34 will take data from an EMI scanner and produce X-ray pictures of the brain which the scanner itself cannot produce.

The Medical Research Council is providing £57,451 to fund the joint project of Hull Royal Infirmary and Hull University. Data from the EMI machine's scans, each of which is a "slice" picture of the brain, will be transferred to the PDP-11 magnetic tape.

There the separate scans will be combined in a three dimensional construct so that new slices can be displayed going through the brain at any angle, not just horizontally through the head as with the scanner alone.

A whole new suite of programs will have to be written to do this processing, and the display is being made by the University's Electronic Engineering Department.

Spinwriter challenge from NEC

COMPETITION for the well established daisy-wheel printer in the word processing market is being introduced by Nippon Electric in the form of the Spinwriter, which has a print element shaped like a badminton shuttlecock.

Claimed to be capable of 55 characters per second, the Spinwriter has 128 plastic character "petals" as opposed to the daisy-wheel's 96, and these are arranged in a circle like the features of a shuttlecock around the base of the removable print element. The petals have less distance to travel than in a daisy-wheel machine.

The machine is being distributed in Europe by DRE, at an OEM price of £1,450. Keyboard versions and receive-only versions are available, with a range of standard interfaces.

Print spacing can be 10 or 12 pitch or proportional, printing backwards or forwards. Type elements come in character sets for several European languages, Arabic, and Japanese. There is also a graphics capability.

Cortez Plus used

LATEST to install Zeus-[illegible] Cortez Plus transaction processing system is Short Brothers Ltd, of Belfast, manufacturers of aircraft and missiles. The company will use the software to support production control enquiries, in conjunction with an IDMS database running on an ICL 1903T.

Interactive hotel system

WITH enhanced capabilities, the NCR 250-8000 front desk hotel accounting machine and the NCR 250-5000 electronic restaurant sales terminal can now communicate with each other, enabling an interactive hotel system to be formed.

The NCR 250-8000 can operate interactively and be buffered with up to 250-5000 restaurant terminals all of which can share a common memory. Each of the four 250-5000s can also be linked online to further 250-5000s giving a network of up to [illegible] terminals.

On the NCR 250-5000, up to three menus and 500 price look-up items can be stored, and 128 waiter totals and analysis of sales per employee hour can be handled.

For restaurants with a large number of tables, the terminal can hold real-time balances for every table.

"Computer Weekly", "Data Processing" and "Systems International" present

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Registration at the door costs £2, but free advance registration tickets will be sent if you return the application below to reach us not later than November 22

COMPEC'78
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Please send me ...... free pre-registration tickets for Compec '78, which will save me having to pay £2 at the door

Name ....

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To Compec Tickets, Room 821, Dorset House, Stamford Street, London, SE1 9LU, England.

CW

SPOTLIGHT ON BUILDING SOCIETIES

All this—and cheap mortgages too

A WALK down any high street offers ample evidence of the attractions of a data processing career within the building society movement.

The building society movement has made it easier for young couples in Britain to realise that elusive dream of a home of their own than it is in almost any other Western European country — or the United States.

At the same time, the rates of interest offered to investors are sufficiently attractive for most people have at least one building society account as well as a bank account, and growing competition in convenience and service means that many people forgo cheque books altogether and run their building society account as a current account.

Some of the most go-ahead societies have implemented excitingly ambitious online systems on very lean hardware configurations. For example, the South of England Building Society supports a network of passbook updating terminals in its branches, supported by a nine-year-old Century 201.

The South of England will be deciding in a week or two on the mainframe to replace the NCR Century, and NCR is well placed to win the business with its all new Criterion series — already in use at the Principality Building Society in Cardiff, which has a Criterion 8550.

The Birmingham Building Society, also an NCR user, is in the process of installing a Criterion 8450, and is looking for a programmer or programmer analyst.

These three societies all use NCR hardware, but with over 450 societies in the movement, most of the major manufacturers are well represented. Perhaps the most tightly-knit group is the ICL customer base where several societies are in the process of installing 2960s. And there is even a choice of operating system to work on, with the Northern Rock in Newcastle going for VME/K, while the Anglia, Hastings and Thanet is implementing VME/B on a dual 2960.

Also in the ICL camp, with plans to move to a large 2900 in 1981, is the Britannia Building Society, based at Leek, Staffordshire. The society currently runs an ICL System 4/72 supporting Datasaab minicomputers and counter terminals installed in its branches.

There are plenty of job opportunities at the Leeds Permanent, where an IBM 370/148 is being installed for 12 months while the Society prepares to take delivery of a shining new IBM 3031. The 3031 will replace the 148, is being retained to provide back-up.

The Leeds is planning to update its software as well as its hardware, and to expand its online network.

Also in the IBM camp, the Halifax Building Society, biggest of all, runs on a very lean installation indeed, a 370/155 and a 145 which is in process of being replaced with a second 155. But the Halifax has a project running to evaluate an online cash-dispenser — a trend which is bound to be followed by other societies over the next few years.

Two of the biggest societies run on large Univac installations, the Nationwide with an 1110 in Swindon, and the Abbey National in London, which is in the process of moving from an 1106 to the big new 1100/80.

It is clear from this brief résumé that the building societies offer almost unrivalled opportunities for getting in on the ground floor in the development of large communication systems, for working with the latest hardware — if you want to — and for building a career in banking and finance.

Salaries are fully competitive with those offered in the industry as a whole, and most societies offer attractive fringe benefits such as private health insurance.

And for people who have still not made up their mind, there is one other benefit which usually quells any doubts. Building society employees are entitled to low-cost mortgages.

SENIOR COMPUTER OPERATOR

Coventry Economic is a progressive building society, with 45 branches throughout the Midlands that service in excess of 250,000 customer accounts.
As part of our continuing development we now have an interesting career opportunity for a SENIOR COMPUTER OPERATOR to head a small team of operators at our Head Office installation.
This is a senior position within the Computer Operations Department and the job holder will be responsible to the Computer Operations Manager for the efficient utilisation of the Society's Honeywell 64/30 Computer.
The Society is currently developing on-line systems and by mid-1979 the first phase of the communications network should be operational. The person appointed will be closely involved with operational aspects of the network.
Applicants should have several years operating experience in a senior capacity within a multi-programming environment and be able to demonstrate a sound technical ability. Level 64 and communications experience would be an advantage.
We can offer an extremely attractive pay and benefits package, including a competitive salary (depending on experience) and preferential staff mortgage scheme.

Relocation expenses will be paid in appropriate cases.

Write with brief details of age, experience and current salary to,
Barrie Day, Personnel Manager,
Coventry Economic Building Society,
P.O. Box 6, Little Park Street, Coventry CV1 2JZ.

Coventry Economic Building Society

PROGRAMMER/ ANALYST

Start salary up to £5,043 (plus major fringe benefits).

Applications are invited from mature and capable people with at least 2 years NEAT/3 programming experience to join our Data Processing Department.

The Society will be replacing its NCR CENTURY 75 with an NCR CRITERION N8450 in the very near future and plans to develop an on line communications network to initially supplement and eventually replace its batch processing environment

An exciting career is offered to applicants prepared to work on their own initiative and accept the responsibility that the position demands. An attractive salary structure (to be reviewed 1st January, 1979), concessionary mortgage facilities and free membership of BUPA are amongst the benefits provided

In the first instance applicants should write giving details of educational background, career history and current salary to

Computer Services Manager
(Staff Appointments)
Birmingham Building Society
42-44 Waterloo Street
Birmingham B2 5QB

BIRMINGHAM BUILDING SOCIETY

Computer Operators

£3600-£4800 (inc. Shift Allowance)

The Society is seeking applicants in the age group 20-35 years who have gained a minimum of five GCE 'O' level passes including Maths and English Language. The successful applicant will have at least one year's experience of working in a Computer Operations environment and will form part of a team manning the Society's new UNIVAC 1100/80 series machine, installed in its Computer Centre in the Baker Street area of London.

The position will entail shift work for which a substantial allowance is paid. Other benefits include modern catering facilities, contributory pension scheme, BUPA membership, life assurance and special staff mortgage facilities.

For application form write to:

D. L. Howard, Senior Personnel Officer, Personnel Department, Abbey National Building Society, 27 Baker Street, London W1.

ABBEY NATIONAL

THE ALLIANCE BUILDING SOCIETY, 6th largest in the country, is recruiting data processing staff to join its existing teams engaged in the development and implementation of on-line data base systems. Based at Hove on the Sussex coast, the Society has recently taken delivery of a Burroughs B6700 to replace its existing ICL 1900 equipment

The following staff are required

Senior Programmer

— up to £[illegible] per annum plus staff mortgage — at least three years programming and preferably some supervisory experience required. A knowledge of Burroughs systems would be an advantage.

Cobol Programmers

— up to £5,050 per annum plus staff mortgage — preferably two years' programming experience required.

Clerk/ Programmers

— up to £[illegible] per annum plus staff allowance and staff mortgage — the main objective of these jobs is to provide technical support to the operations department regarding the efficiency and security of the software and the establishment of standards. Applicants should have large systems operating experience plus an interest in, and an aptitude for, programming

These are attractive posts in a rapidly expanding environment offering job security and the opportunity of participating in new development. The salaries are negotiable up to the figures shown above and they can be significantly supplemented by generous assistance with house purchase. Fringe benefits include a first-class pension scheme, subsidised restaurant and an active sports and social club

Please write or telephone for an application form to

Adrian Tindley, Staff Officer
Alliance Building Society, Alliance House
Hove Park, Hove, Sussex BN3 7AZ
Telephone Brighton 776464 Extns. 62 or 63

ALLIANCE BUILDING SOCIETY

Cobol Programmers
London £4,500–£5,500

Come on in!

The Society is currently using a Univac 1100/80 Series Processor with a Telecommunications network serving 600 on-line terminals. Due to expansion the Society is extending its use of advanced computing systems and consequently a number of Programmers with various levels of experience are required.

The successful applicants, who will be based at our new Computer Centre adjacent to Marylebone Station, will join Programming teams developing real time support systems in COBOL. However, training will be given to enable applicants to gain further experience writing real time applications in ASSEMBLER.

Salary will be related to experience which must include some programming in COBOL. Other benefits include advantageous house purchase scheme, subsidised restaurant and BUPA membership and Season Ticket loan.

Applicants should write or telephone: D. L. Howard, Senior Personnel Officer, Abbey National Building Society, 27 Baker Street, London W1. Tel: 01-486 5544 Ext: 284.

ABBEY NATIONAL

Head of Computer Services
c. £7,000 + benefits

This key vacancy within the senior management team of the Derbyshire Building Society arises with the impending retirement of the present holder. One of our largest regional societies with assets over £200m, the Derbyshire offers the opportunity to join a progressive and rapidly expanding organisation with a working environment second to none, Duffield Hall in the lovely Derwent valley, just north of Derby.

An integral part of a young management team of dedicated professionals, you will have overall responsibility for the present installation, a refined ICL 1901T with on-line facilities at Head Office. With the Society's commitment to computer development, a broad on-line feasibility study is now nearing completion. Together with this your area of responsibility will include maintenance of comprehensive computer and systems development plans, advising on acquisition, enhancement and replacement of all DP equipment.

The successful candidate will be aged 30-40 with a detailed knowledge of computer technology and operations together with extensive staff management experience. Previous experience in a financial service or related environment would be an advantage.

The post carries an attractive employment package usually associated with a building society including a car, house purchase facilities and contributory pension.

Telephone or write to David Harris
P.E.R., Lambert House East, Clarendon Street
Nottingham NG1 5NS, Telephone 49781

PER Professional & Executive Recruitment

Applications from both men and women are welcome

CHRIS PRIER
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ANALYST/ PROGRAMMERS

CENTRAL LONDON **TO £7000 + BENEFITS**

If you possess a sound D.P. background and are now seeking to progress your career within a most successful organisation, then our client can offer an exceptional opportunity to develop your full potential.

The Company is implementing a four-year development plan which includes the introduction of mini computers throughout Europe and the implementation of Database (DL/1) projects on an IBM mainframe.

Two ANALYST/PROGRAMMERS are currently required to support users, both in this country and abroad, on a variety of applications. Candidates should be prepared for international travel and be able to communicate at all levels of management. Drive and ambition are relevant qualifications along with the ability to organise your own work schedules, producing results with a minimum of supervision. Successful applicants will not be disappointed with the job content and can look forward to a most rewarding and exciting future.

Generous starting salaries are augmented by a NON-CONTRIBUTORY PENSION SCHEME, 65p per day LVs, season ticket loan, 4 weeks' holiday and a 35-hour week.

Ref. S1/2809

APPLICATIONS SOFTWARE MANAGER

WATERLOO BRIDGE **TO £10,000**

Tymeshare UK is a fast expanding timesharing bureau seeking an experienced project systems manager to manage a team of systems and programming professionals. The position involves full budgetary, personnel, project evaluation and development responsibility together with quality assurance, staff recruitment and training. The existing team is currently supporting a sales and marketing force which itself is in an expansion phase and it is intended to enhance the systems and software support function over the coming year with several additional staff.

Applicants should have a strong systems and programming background, together with man-management experience gained ideally in a client-orientated environment. Sound educational background together with communication skills and the ability to contribute to the management resource of the company are all prime requirements for this position.

The company offer a negotiable salary package made up of a high basic salary and commissionable income related to the department's billing as a profit centre. Additionally a company car scheme and attractive offices situated close to the Aldwych make this an exciting and challenging opportunity for an ambitious self-starter.

Ref. W1/2809

24-hour answering service
Please telephone for a confidential discussion or write to:
30 Fleet Street, London EC4Y 1AA
01-353 0981

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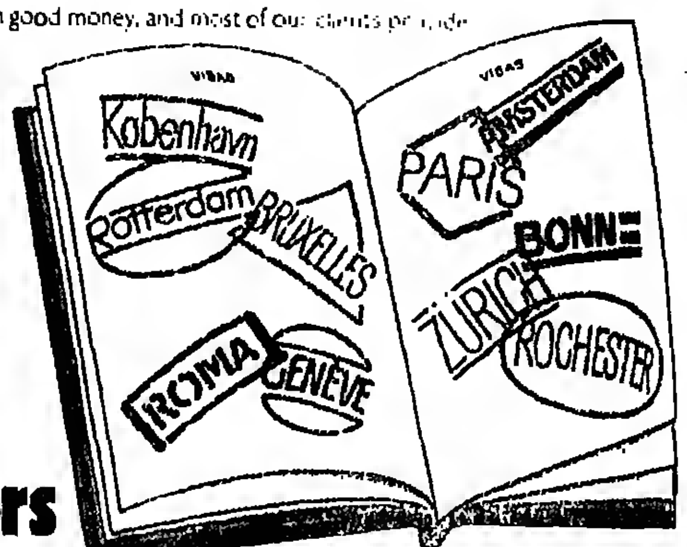
The Knight contractor. As much at home in Rotterdam as Rochester

Knight Computer Services has contracts in Europe, or even further afield for you.
Or in your own area of the UK.
It all depends on what you're looking for next, and what your experience proves you can handle.
If you work abroad, you'll earn good money, and most of our clients provide free return flights and other expenses.
If you stay in the UK we can assure you of a high salary and valuable experience that will put another piece in the jigsaw of your career.
And, although the length of time that your contract lasts is flexible, you'll find that we'll go on working for you for years.



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European languages a distinct advantage

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IBM
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STOP PRESS BRUSSELS
ICL 2903 EXEC 8 Operator, French and German verbal. ... Now

For further details or advice on these or other **U.K.** and **European** ... call Sue Smyth, June Mogg or Jane Asbury, NOW! on 01-491 4706 or 01-439 3411

Programmers/Analysts

Immediate/Forthcoming Assignments

Belgium
IBM RPG II + COMMS
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ICL 2900 COBOL (FRENCH HELPFUL)

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UK
IBM COBOL + DOS - London
IBM PL/1 + OS - S. Coast
IBM PL/1 + OS - Middx.
IBM ASSEMBLER + CICS London
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IBM RPGII + CCP - Middx.
PDP RSXII FORTRAN - Berks.
PDP RSXII ASSEMBLER - Berks.
PDP RSXII MACRO 11 - Kent
PDP RSXII CORAL 66 - Dorset
DATA GENERAL NOVA ASSEMBLER - Herts.
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STOP PRESS LUXEMBOURG
3 years exp. of COBOL. Practical e. ICL 2980/70/60. Knowledge IBM COBOL, ICL UTILITIES 2900 ... Training can be given. French ...

Please contact Richard Kaluzynski or Sue Gillam: 01-491 4706 or 01-439 3411
All vacancies are open to both male and female applicants.

Knight

Knight Computer Services Limited,
14 Old Park Lane, London W1Y 4NL.
Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

01-491 4706

JBA

HOLLAND

CAD Specialists **circa £14,000 package**

The business of our clients is the utilization of computer techniques in engineering design and manufacture. They provide the necessary consultancy expertise, first rate hardware and software systems and effective pre-post sales support services.

Due to increased penetration of the European marketplace, additional personnel with CAD and part-programming experience are required. Ideally candidates will have a background in NC and/or geometric modelling systems particularly in the car or aerospace industries. The positions will involve extensive European travel, liaison with all marketing and design areas in a consultative role. Limited programming is envisaged.

Excellent overseas staff opportunity - good relocation package - unlimited career prospects.

Contact Mike Creamer

IBM BAL Programmers

London based. **£6,500 – £9,000**

Our client is a recently established software house, which already has a number of major contracts with extremely prestigious organisations. The long term aim is to move into software development, for which their plans include the installation of a PDP 11 minicomputer.

They have an immediate requirement for experienced BAL programmers, and are offering extremely generous salary packages. Basic salaries range from £5,000 to £8,000 pa according to experience, plus profit share and bonuses to £1,500 pa. Relocation assistance will also be available where necessary.

A phenomenal chance to be in at the start of what promises to be an extremely successful venture.

Contact: Andy Wright

Software Specialists

London **up to £9,000**

Our client, the leading software product organisation in Europe, has a requirement for specialists to develop and support software packages which will be marketed world-wide.

Applicants should have at least three years experience of IBM hardware and be very familiar with either DOS/VS, OS/VS, DL/1, VTAM, 3270, 3600 or 3790. A sound background of BAL is obviously essential.

The company offers a dynamic professional environment, generous salaries, benefits, and the chance to travel in Europe and North America.

Contact: Jim Baker

Senior Analyst/Programmer

Herts **up to £8,500**

This well known and successful minicomputer manufacturer wishes to appoint a senior person to take responsibility and be involved in the design, programming and implementation of its own internal commercial systems. Suitable applicants will have several years experience in the design of commercial applications and be prepared to undertake any of the programming as may be required. In addition to the development work the successful candidate will also be responsible for an existing operations group. Ability to communicate with user departments, control projects and manage other technical staff are obvious prerequisites for this appointment.

This is an ideal opportunity for a senior technician with drive and ambition to move into d.p. management.

It is unlikely that the initial salary will be less than £7,000 and the company offers the usual benefits in a professional environment.

Contact: Margaret Stevens

AUSTRALIA

We have recently heard that our Australian Associates succeeded in placing nearly all the d.p. emigrants who originally applied to JBA and who arrived in Australia during August and September. Naturally we are delighted to hear that our special service for d.p. emigrants is continuing to be effective and is saving the individuals concerned unnecessary worry prior to departure.

If you are a professional programmer, systems analyst or manager and seriously considering emigration please call us. We'd like to help.

Contact: Mike Creamer

Chief Programmers

Middlesex **circa £7,500**

Several of these Management positions are currently vacant within our client organisation, each being appropriate to a particular industry group. This enables us to consider applicants with either a varied programming background or a specialised track record up to senior supervisory levels.

The positions are concerned with recruitment, training and motivation of staff as well as applying leadership and technical expertise. Previous experience of estimating, scheduling and project control is particularly relevant, also knowledge of database techniques is desirable.

First class relocation employment conditions and career prospects.

Contact: Mike Creamer

For information on any one of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

/SELECT COMPUTER OR DATA ** /AND CS = INFOLINE AND YR GT 78

If this makes sense to you,* you could be the person we need to become part of a small enthusiastic team setting up the first fully commercial U.K. on-line bibliographic information service.

The work is challenging and unusual, and the level of job satisfaction high. You will take full responsibility for your allotted tasks, and will be able to make a real contribution to the development of a new company.

The post is that of Analyst/Programmer. Experience in any of the following areas would be useful:

FORTRAN, COBOL, information retrieval, database management, UNIVAC 1100 Series, interactive program development.

Salary probably around £5500 depending on qualifications and experience. Other benefits are those normally associated with a much larger organisation. Location on the Embankment, close to Waterloo and Charing Cross.

If you would like to know more, phone Patrick Gibbins on 01-836 1876 to arrange an informal meeting with the systems team.

*If the headline doesn't make sense, but the job sounds interesting, phone us anyway, and find out.

INFO LINE

THORN LIGHTING

One of the largest lighting equipment manufacturers in Europe with seven major factories in the United Kingdom and two research and development centres.
The Company has established subsidiaries in most member countries within the E.E.C. Factories exist in Sweden, Germany, Italy, South Africa, Australia, New Zealand and India.

Financial Systems Analyst

Responsible to the Financial Systems Manager the holder of the post will be involved with 6959 Data Entry Communication Systems and computer links to ICL Computers (1900 and 2900 Series). It is essential that applicants have COBOL programming experience and ideally, eighteen months Systems Analysis experience relating to ICL machines.

Applicants are invited from men and women and should be made in writing, giving details of age and experience to:

The Personnel Manager (FSA/GW), Thorn Lighting Ltd, Gt. Cambridge Road, Enfield, Middlesex EN1 1UL.

THORN a world of difference

SHADOW II PERSONNEL

Rendeck is a medium-sized international software house with offices in the Netherlands, England and the U.S.A. Our group of companies work in various fields and aspects of the computer industry with the main emphasis on database and data communications projects, and owing to our marketing of Shadow II in the Benelux countries, the majority of our teleprocessing work is concerned with Shadow.

We require Cobol programmers and analysts with at least one year's experience with Shadow to join our companies as part of our planned expansion for early 1979. Successful applicants will work in one of our teams on projects in the Netherlands or in the U.S.A., where salaries, expenses and benefits will be well above average.

Initial interviews will be held in London throughout October.

Please write with personal details or telephone for an application form, when a mutual appointment can be arranged, to our London or Amsterdam office.

Bridget Kotchie
RENDECK LIMITED
100 New Bond St.
London W1Y 9LF
Tel. 01-629 5438

Rendeck

Richard Meddocks
RENDECK NEDERLANDS BV
A.J. Ernststraat 157
Amsterdam
Tel. (0103020) 461215

DISCOVER GOLD IN LONDON

One of the World's largest Companies dealing in natural resources is currently expanding its Data Processing department. This expansion is due to a five-year development programme, which includes many new projects and the changing from 2 x 1BM 370s to an **IBM 3031 in mid-1979.**

Much of the work will be new development using DATABASE and is widely varied across forty applications.

CAREER PROGRESSION can either be into Systems Analysis, Programming Management or Software Programming.

TELEPHONE: 01-839 6087
Bill Taylor

The following positions have therefore been created due to this expansion

PROGRAMMERS (Retrain to IBM if necessary) c. £5500

The Company uses the following languages Cobol, Mark IV, RPG II and Datashare for Minis. You will require a minimum of two years' programming experience, preferably in one of the above languages. Training will be given in other Languages.

PROGRAMMER/ANALYSTS c. £6000

You will be involved in design, program specifications, user liaison, programming and implementation

SENIOR PROGRAMMER c. £6500

Experience of Cobol to work on IBM 370 applications

BARNARD DAVIES & WARD LTD 107 Jermyn Street London SW1Y 6EE

If you think you work for a company that has probably the best range of equipment in the data entry, file handling and distributive processing markets and offers a demanding, rewarding career with a large multinational company — and it isn't INFOREX — THINK AGAIN.

We want the best people
We expect to offer the best career development
We need immediately:

4 Salesmen

South East
West
North West

At least 3 years' successful selling in the computer industry is required.

1 Product Engineer

Harrow based

A high level appointment, technically supporting field engineering. You need three years' engineering experience on digital computers, associated peripherals and knowledge of communications.

2 Sales Support Representatives

South East

To demonstrate the full range of equipment, train customers and assist in a pre-sales environment.

You all need one thing in common — You have to be the best.

If you think you are, write or phone:
Mike Arblaster
Marketing Services Manager

INFOREX Data Management Systems

INFOREX LTD.
Inforex House
Headstone Road
HARROW HA1 1PL
Tel: 01-863 8311

MODCOMP are establishing a UK manufacturing capability and software development programme and, as a result, have vacancies including the following:

Software Engineer
to £10,000 p.a.

This is a key role in the new manufacturing plant at Wokingham providing software support to the European manufacturing area. This will involve assisting systems level technicians in diagnostic and operating system check-out, and generating total software packages to customer specifications. Ideal candidates will have about five years experience of software design, support or troubleshooting.

Software Designers
to £9,000 p.a.

We need two highly experienced software designers to establish the development and maintenance of all new communications products at Wokingham. Each will have the ability to take a product through to implementation either as an individual or team leader. Experience is desirable in communications, operating systems, assemblers, emulators etc., at design or support level.

Analyst Programmer
to £7,000 p.a.

We need a highly competent Analyst Programmer to establish an internal commercial D.P. function. His/Her first task will be to design and program accounting and Management information systems. These will be written in Cobol using Modcomp Mini hardware and software. Applicants should be experienced in Cobol, some Fortran would be useful, and have the ability to see a project through from inception to implementation.

Company benefits are excellent and include free BUPA and non-contributory pension. Relocation is possible.

For further details ring ANNE CAMPBELL at (0734) 791170 or send a resumé to her at
MODULAR COMPUTER SERVICES
Broad Street, Wokingham, Berkshire

MODCOMP

OPERATORS
AVOID NIGHT SHIFTS!

LONDON, W.1 **Up to £3,800**

We are recruiting for clients who have a major West End installation, including ICL 2980, IC 1900 and minis. Working conditions and prospects are good, training is provided, and hours are favourable (two shift only. Monday/Friday).

You should be 22 or over, with at least 4 'O' levels, and 1-2 years' practical operating experience, on any mainframe or mini.

Ring us in confidence (ref. 541), or leave a message on our answering machine after hours.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

Water Data Unit, Reading

Applications Programmers

■ Prepare and test application programs on collection and retrieval systems for environmental data ■ ICL 1904S operated under George 3 system ■ MOP terminals used extensively.

□ Degree/HND/HNC or equivalent in a science subject □ Programming experience and knowledge of COBOL essential □ FORTRAN/PLAN/FILETAB advantageous □ Knowledge of ICL 1900 hardware and GEORGE 3 advantageous □ Age normally under 30 □ Appointment as Higher Scientific Officer (£4100-£5450) or Scientific Officer (£2840-£4410) according to qualification and experience □ Ref: SA/10/HJ.

■ *Application forms (for return by 20th October 1978) from Department of the Environment, Room 446, Lambeth Bridge House, Albert Embankment, London SE1 7SB; telephone 01-211 3325 or 7158.*

Science Group CIVIL SERVICE

RPG 11 PROGRAMMERS

NR. WEMBLEY To £6,000
Around 2 years' experience is required to work on new distributed computers, designing and developing packages for users

NORTH SURREY C. £5,800
A Programmer wishing to learn systems work required by an international company

ENFIELD C. £5,000
Subsidiary of major bank needs 2 years' experience for System 3 Mod 15D on-line. Magnetic tape and additional core and screens planned.

LONDON, W.1 C. £5,000
At least 18 months' experience on System 3 or Honeywell 62. Opportunity to learn COBOL — relocation expenses

GREENFORD C. £5,000
With only 1 year's experience you could assist in the design and implementation of new systems; and write RPG 11 programs using CCP for on-line functions.

NR. WEMBLEY To £4,500
An American-owned company require 6/12 months' experience writing, modifying and testing programs

SUSSEX C. £4,300
this Engineering Company could use you. advantage.

Please telephone 01 434 1106 for more details and an application form, or 01-767 0811 between 7 p.m. and 9 p.m.

Please telephone, or call in for details of these and other vacancies and an Application Form.

AMES PERSONNEL
Employment Agency Suite 14, Dryden Chambers, 119 Oxford Street, London, W1R 1PA Tel: 01-434 1106

ARE YOU A RED HOT DIBOL PROGRAMMER?

An experienced DIBOL Programmer is required immediately by a large Public Company subsidiary involved in developing commercial Business systems on DEC mini-computers.

Salary to £6,000 per annum for the right person together with Bonus and Profit Sharing Scheme.

Applications to: R. V. Bloadon, Director, Systems, Wilkes Computing Ltd., Bush House, 72 Prince Street, Bristol BS1 4HU

Telephone: Bristol (0272) 290651

UNIVERSITY OF BRISTOL
SWALCAP

A SENIOR OPERATOR

is required by SWALCAP which is based at Bristol University. The unit provides on-line real time services to libraries in Wales and South England for book circulation control and cataloguing. A link has recently been established with a computer in Harlow, Essex in order to provide members with access to information retrieval facilities. The existing network involves a Rank Xerox 530 and Computer Automation LSI 2/20 mini-computer at the central site. Terminals in libraries are linked via additional Computer Automation LSI 2/20 mini-computers and Datel 2400 lines to the Central Site.

Applicants must be capable of taking responsibility for the efficient operation of the RXDS 530 and associated equipment for his/her shift and should have at least two years' operating experience. Previous experience of operating a RXDS 530 is not required. The post provides an opportunity to become involved in all aspects of computing.

The commencing salary will be at an appropriate point, according to qualification and experience, on the scale of £3078 to £3774 plus two-shift allowance of £320.

For further particulars either write to SWALCAP, Wills Memorial Building, University of Bristol, Queens Road, Bristol BS8 1RJ, or ring Richard Hudson or Malcolm Green on Bristol (0272) 24161 Extn 918. Applications should be sent within 14 days of the appearance of this advertisement to SWALCAP at the above address.

Software Expertise Ltd

CONSULTANT PROGRAMMERS & PROGRAMMER/ANALYSTS
Up to £8,500

Four years ago, Software Expertise set out to build a reputation in a very overcrowded business. We knew there was no shortage of software houses, but we also knew there was a huge short-fall in software expertise. So we decided to invest in the best professionals — and, when you look at the way our client list has grown, you really can't fault our thinking.

Over the years we've also stuck to the principle of being totally honest with people.

We're a small team, but we're a lot more professional than the bulk of software consultancies (at least our major clients think so). And we also believe there's a lot of room for expansion in software.

We hope you share our enthusiasm.

Right now, we are in the market for really good commercial programmers and programmer/analysts. Men and women who have been in the business for three or more years and have gained a thorough knowledge of at least two languages. We are also particularly interested in people with experience of Database/Data Communications and IBM systems.

If you qualify, we will be offering much more than just a good salary.

We will be giving you the chance to work on a variety of projects for some of London's largest computer users. In other words, you'll get the high-level involvement without the full-time frustrations. We will also offer you every opportunity to train and develop your specialist knowledge.

And most important of all, if we like each other, you will form the nucleus of what is arguably the most able and successful young software company in London.

Believe us, if you join our management team, you can forget about £8,500 and start thinking in terms of five figure salaries.

Let's talk.

Software Expertise Limited,
140 Tachbrook Street,
London SW1V 2NE
Tel: 01-821 7914

Alberto

EDP MANAGER c.£7500
BASINGSTOKE

First-class opportunity for Senior Systems Analyst to attain first managerial position controlling system 3 model 8 (shortly to install system 34) reporting to European Controller. Fast moving international company in the toiletry/haircare market with such brands as Alberto Balsam and VO5. Young, dynamic flexible approach essential with large scope for development. Re-location expenses considered. All large company benefits included.

Please telephone Basingstoke 57222 for an interview or write enclosing c/v to.

Norman Lindsay, Alberto Culver Company
Telford Road, BASINGSTOKE, Hants.

URGENTLY NEEDED FOR SIX MONTHS

COMPUTER SCIENTIST / BIOLOGIST

With either

— experience of the UNIX operating system and/or
— experience in computing and medical or biological research

The ideal candidate will have worked on Cardio-vascular laboratory automation using DEC PDP-11/LSI-11 computers running under the UNIX operating system. New graduates will be considered and employment as a consultant may be considered. Please send letter of application together with curriculum vitae as soon as possible to

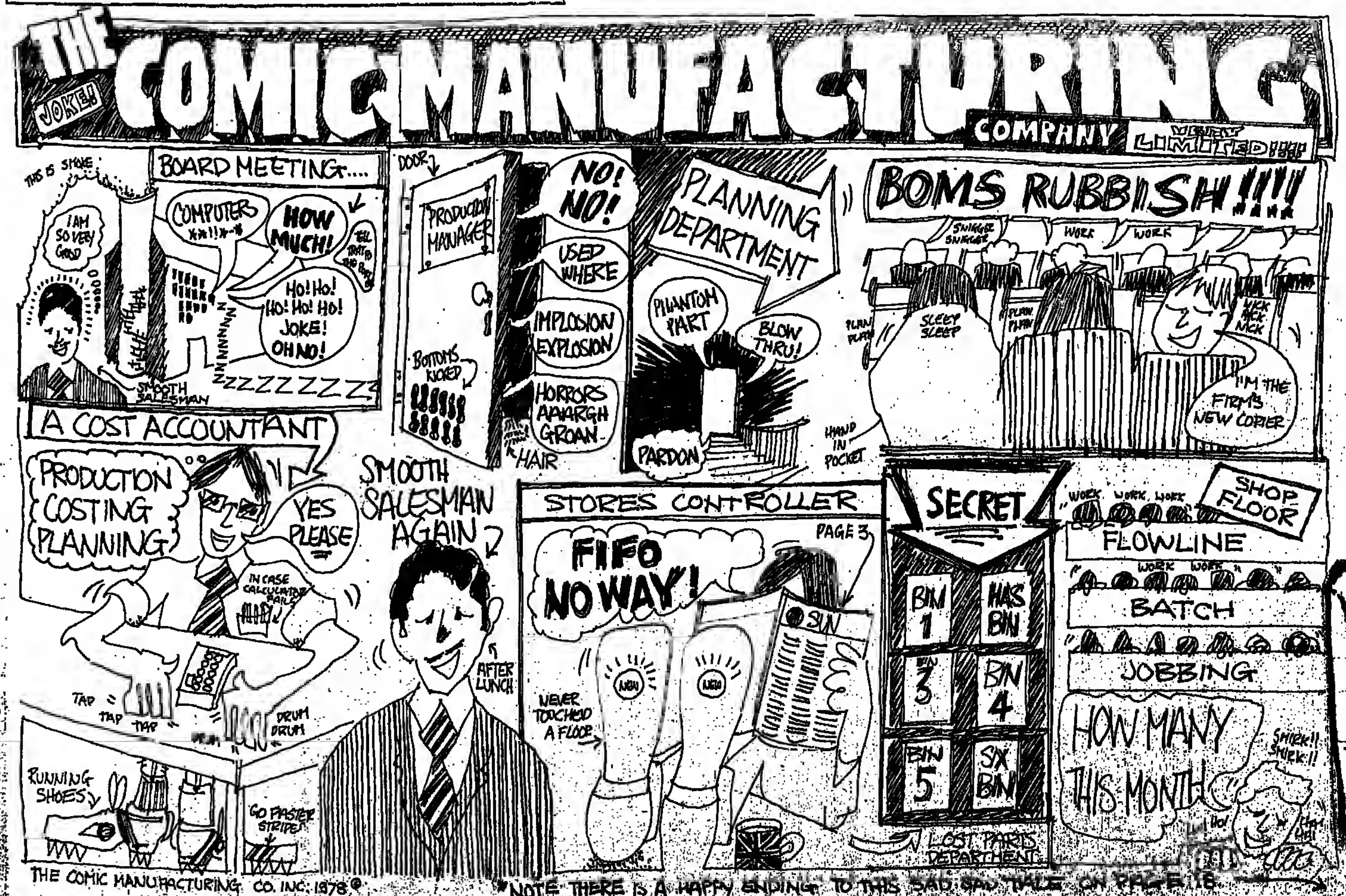
Dr I R PERRY
L.E.R.S., 58, rue de la Glacière, 75013, PARIS

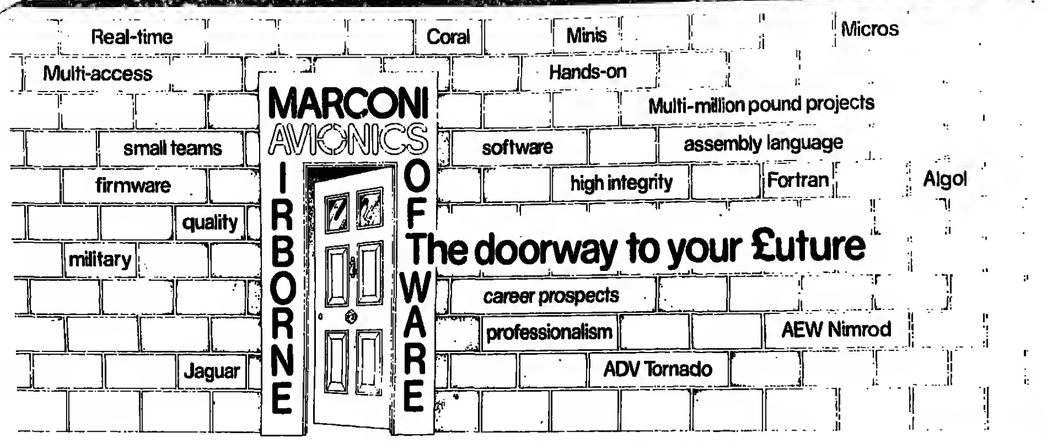
DATA PROCESSING MANAGER
Saudi Arabia
Salary up to £18,000 p.a.
18 mth. contract

An American Plant has immediate openings for a Data Processing Manager who will lead a team of Systems Analysts to develop and implement a Management Information System for a major construction project. The ideal candidate will have similar experience in developing and implementing diversified systems in the Middle East.

Excellent benefits package include accommodation, cost of living allowance and liberal vacation period. Marriage status as soon as housing available.

Rush resumes to
ADVANCE PERSONNEL SERVICES LTD. (Agy)
The White House, Lodge Road, London, NW4
or Tel. 01-203 4272





To find out more about what we do and how, phone Peter Chinn, Manager, Airborne Software Division on 01-953 2030, extension 3239 or write to H.E. Batchelder, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Please quote reference MA 78109.

NEWCASTLE-UPON-TYNE POLYTECHNIC
Chief Administrative Officer's Department
SYSTEMS ANALYST (ADMINISTRATION)

To be responsible for the development and maintenance of computer based information systems and related Management Services in connection with Academic, Personnel, Finance and General Administrative activities of the Polytechnic. Candidates, who should be professionally qualified and experienced in systems analysis with an administrative background, will be expected to have particular experience in the design of planning and management control systems.

N.R. Solary and Conditions of Service Grades 1-5) £4154-£6076 p.a. plus £312 supplement.

For further particulars and application forms, returnable by Thursday, 12th October, 1978, please send stamped addressed foolscap envelope to the Chief Administrative Officer, Newcastle-upon-Tyne Polytechnic, Ellison Building, Ellison Place, Newcastle-upon-Tyne NE1 8ST

FREELANCE PROGRAMMERS
£180 to £400 p.w.
3 yrs. + exp. All Comput UK & OVERSEAS
USES 01 995 3981
FREEPOST LONDON WIE

COMTECH

SYSTEMS PROGRAMMER IRELAND

THE COMPANY
Comtech (Ireland) Ltd. is a rapidly expanding software research and development centre located in pleasant surroundings in Cork, Ireland. We are developing systems software for the PDP-11 range including a Database Management Package SAGE.

THE JOB:
To assist us in our expansion we require an experienced systems programmer or alternatively an applications programmer with the desire and aptitude to undertake demanding projects in systems software. At least 3 years experience is required including some BASIC PLUS or MACRO-11. A degree in Computer Science or other numerate subject would benefit.

THE BENEFITS
Apart from working in the vanguard of software development during the mini/micro revolution we offer an unbeatable salary for the right person, superannuation scheme, other fringe benefits and will provide relocation expenses when necessary.

Telephone Cork 821432 (reversing charges) or write to:
Bob Kidney, Technical Manager,
Comtech (Ireland) Ltd.,
Lotemore, Tivoli, Cork.

This time move to Worcestershire!

ANALYSTS

Midlands **£5000 to £5500**

Sandvik U.K. Limited is the British subsidiary of an international Swedish group involved in a range of modern engineering activities.

We are offering opportunities to ambitious Systems Analysts to make a career with our world famous organisation which uses a Burroughs 83700 main frame for a range of advanced applications, involving on-line base and tele-processing techniques, and is in the course of planning a further major expansion during 1978.

Based in Halesowen, overlooking the Worcestershire countryside, our company is prepared to relocate the right people at our expense.

The experience we seek will ideally involve the use of Burroughs hardware and software, a high level of programming language (preferably COBOL) and detailed involvement in at least one commercial application from investigation to implementation.

In addition to basic salary, our benefits include productivity bonus, 23 days holiday, life assurance and pension plans. Successful members of our OP Department have moved on into careers with the Sandvik Group world wide.

For further discussion telephone our OP Manager, Doug Stenson on 021-550 4700, Ext. 374.

For an application form, telephone or write with brief details to: Personnel Office, Sandvik U.K. Limited, Manor Way, Halesowen, West Midlands B62 8QZ.

SANDVIK

Introducing... a new series of careers advice with ARPEEGEETOO

the world's leading expert on

ANALYSTS AND PROGRAMMERS WITH RPG II EXPERIENCE

This week Arpeegeetoo says
'Why confine your skills to one installation when you could work on hundreds'?

Don't you find that working for just one user soon ceases to challenge your ability?

After all, once you've set up the system there's not much more to do than twiddle the knobs and tie up the ends, is there?

You could be using your skills on greater variety for much higher financial rewards. Take the people down at Altergo Business Systems for example.

They're professionals in RPG II work—they travel around developing and installing systems for various companies in different situations.

If you joined them as an Analyst or Programmer you'd find yourself being asked to solve a variety of problems on one new project after another.

They particularly need people with experience of IBM machines ranging from System 32, 34 to System/3 Model 15D, and they're willing to pay very high salaries to get you if you've got ambition as well as ability.

Don't be surprised at that—Altergo is just about the most successful software group in this country. Business with them is so good, they can afford to make sure they find and keep the right people.

If you want to travel far and wide, that's great. If you'd rather stay roughly where you are now, that's OK too. Either way, there's always plenty of responsibility to be won.

Take my tip—contact Brian Walker, or Barry Whitesman quoting BS/13 on 01-734 9681 or after 8.00 p.m. on 049 481 2713

Altergo Business Systems Limited,
Warwick House,
38 Soho Square,
London W1V 5DP

LICENSED AS AN EMPLOYMENT AGENCY
Computing Services Association

altergo
May our success be with you

Isn't it time you KO'd that computer recruitment problem?

From next week October 5th 1978

COMPUTER WEEKLY

announces THE NEW ONE-TWO

1 ON THE AIR
46,000* D.P. professionals in the Greater London radio area are told to watch out for your advertisement in that week's Computer Weekly!

2 IN PRINT
Your potential employee will have received Computer Weekly at home or at the office and can immediately turn up your ad!

How the scheme works

It's a unique opportunity to tie in your Computer Weekly recruitment ad. with a spot on popular Capitol Radio—at very low cost. The radio ad. will give tempting outline details of your company and the job you are offering—and will then refer the listener to the appropriate page of Computer Weekly.

When it happens

It will be broadcast during the morning breakfast-and-drive-to-work period on the Friday of the week in which your advertisement appears. Younger prospects, who are probably late-evening listeners, will already have heard it late on the Thursday night.
Each advertiser gets approximately 8 seconds of a full minute-long Computer Weekly commercial. So you share in the cumulative impact of sixty seconds of computer-oriented broadcasting time, at a fraction of the cost of a full "job-spot" commercial.

Free production

What's more, Computer Weekly will produce your commercial spot free of charge, with highly professional studio and production facilities.

Cost and Conditions

The rate is £120 for a commercial spot of approx. 8 seconds on Capitol Radio on both the Thursday and the Friday of the week your advertisement appears.
The copy date remains at 12.00 Tuesday for a broadcast on the following Thursday and Friday. Extraction of the key points from your advertisement will be done by our expert staff—unless you yourself have indicated the points for inclusion.
Unfortunately the salary offered cannot be announced over the air, due to the dangers of an escalation in DP staff salaries.
Demo tapes are available for seriously interested advertisers.

RING CHRIS PRIOR ON 01-261 8028/8658/8000

But hurry! Bookings are strictly rationed until Dec. 1978!
Computer Weekly. The industry journal for the data processing professional.

*Computer Weekly circulation in Greater London area Sept. 1978

DO YOU SEE YOURSELF AS PROSPECTIVE MANAGEMENT?

Below are a few carefully selected positions offering:
★ Good career structure. ★ Job satisfaction. ★ Excellent earning potential.
in banking, finance, insurance and commerce. For details of these and many others we are able to offer, please ring our London office, 01-734 0152/3010 (24 hours).

JUNIOR PROGRAMMER LONDON TO £5,000

Multi-national Company retaining large IBM 370 hardware requires programmers with at least 12 months' ASSEMBLER experience, to join a highly professional team. They are currently developing a major sophisticated on-line system. Company offers
* Highly progressive organisation.
* Continued development with a well-planned schedule.
* Excellent benefits including cheap travel.
* Good promotional prospects.

Ref 1784

PROGRAMMER – CITY & MIDDX. £5,000 neg. + SUB MORTGAGE

Our client, leading bankers require programmers with at least 18 months' experience in RPG 11. Applicant will join a young and enthusiastic data processing team which retains IBM System 3 hardware. Major enhancements are planned to keep pace with company's rapid growth. Applications will be of a financial nature and company offers good promotional prospects.
* Excellent fringe benefits which include banking and credit facilities, profit share and non-contributory life assurance and pension scheme.
* Continued development in a well planned schedule.

Ref 1828

[illegible]

Unique opportunity within multi-national communications conglomerate for project leader. A challenging position holding responsibility for a large team developing a major message-switch system. Duties will therefore include co-ordination of the team design of systems and technical guidance to his/her 4 team leaders. Ideal candidates should have at least 5 years' experience on PDP 11, message-switching RSX and RTL 11 with strong personality and desire to succeed.
* First-class career structure
* Plenty of room for growth and excellent earning potential.
* Well-organised projects and good working teams

Ref 1827

[illegible] – HOLLAND

International company manufacturing sophisticated technical products for world wide distribution seeks for exciting newly created position. Company have installed PDP 11 using BASIC + and consequently require person with good knowledge of the same, with a good personality and strong desire to accept a challenge.
* Prestige company with American backing
* Good deal of development work using integrated database
* Excellent prospects and early salary review

Ref 1[illegible]

PROGRAMMER – CITY £7,000 + SUB MORTGAGE

If you have at least 3 years' BASIC experience on any MINI, a fantastic opportunity awaits you. Our client, a major international merchant bankers is enlarging its D.P. Department. This EXCITING and CHALLENGING position is an excellent opportunity to follow a career path. Ideal applicant would have knowledge of systems, but training will be offered.
* Good working conditions in a progressive and prestigious company.
* Excellent fringe benefits which include a subsidised restaurant and banking benefits.

Ref 1801

D.P.M. – MIDDLESEX £7,000 + Co. CAR

Our client a major British Company with their head office in Middlesex has a vacancy for D.P. Manager to be responsible for all aspects of the department, including programming and analysis. Ideal applicant will have strong personality, confidence management capabilities and be able to liaise at all levels. Company retains DEC PDP hardware and seeks person with good programming background. This company offers a fantastic opportunity for young person to progress into management.
* Excellent working conditions.
* Security in growing organisation.
* Fantastic fringe benefits.

Ref 1705

TEAM LEADER WEST LONDON/[illegible]

International group of companies with its outstanding reputation for efficiency, growth and investment seeks a Team Leader to work on development areas. Ideal applicant will have good technical background in IBM environment. This is a senior position involving project management and quality control of development phases and to assist with the design and specification of the system.
* Good company, benefits which include non-contributory pension, life assurance and sickness scheme.
* RELOCATION assistance if required.

Ref 1823

[illegible] SYSTEMS ANALYST

Multinational conglomerate company is seeking senior systems analyst with minimum 5 years' D.P. experience including commercial analysis in an IBM environment preferably to undertake responsibility for systems analysis, specification and testing of major project phases. Ideal applicant will have CICS/VS and IMS experience but full training will be given
* Continued development with well planned schedule
* Super working conditions including free lunch
* Varied projects providing an absorbing and interesting career.

Ref [illegible]

ANALYST PROGRAMMER CITY £6,500 + SUB MORTGAGE

Established Merchant Bankers has opportunity for person with COBOL and PL/1 or ASSEMBLER to work as an Analyst Programmer. Ideal applicant will be in mid 20's with a degree and preferably will have worked in a financial environment. CICS would be an advantage but training will be given. This is a super opportunity to follow a good career path.
* Excellent scope to move into systems.
* Banking benefits which include low interest loan, and excellent sports and social club.

Ref. 1718

SENIOR SYSTEMS ANALYST EAST LONDON £7,000 + BONUS

Our client situated about 15 minutes from Liverpool Street and easily accessible from eastern home counties, is seeking a senior systems analyst. Ideal applicant will have a programming background in COBOL, preferably in ICL hardware. Company seeks people with good commercial systems experience, e.g. ledgers, stock control, payroll etc.
* Excellent working conditions which include flexi hours.
* Good promotional prospects.
* Comprehensive range of projects.

Ref 1781

SYSTEMS ANALYST – LONDON £7,500 + SUB MORTGAGE

Highly reputed firm of Merchant Bankers with world wide business interests are seeking systems analyst with either financial or insurance experience to work as a key figure within their D.P. services division. Ideal applicant should have worked in an IBM installation but other hardware will be considered.
* Excellent working environment.
* Job security.
* Full banking benefits including bonus

Ref 1750

[illegible] ANALYST [illegible] PROFIT SHARE

Major British Company who retain ICL 1900 series hardware is expanding rapidly and thus seeks systems analyst with minimum 2 years systems experience. Position includes a variety of new projects. Ideal applicant will have good commercial systems experience preferably in ICL environment. This is a senior position and is an ideal opportunity for someone to progress further into management
* Benefits include flexitime, 5 weeks holiday, free lunch sports and social club and discount of company products
* Challenging position with opportunities in variety of areas
* Excellent prospects

Ref 1[illegible]

Computing Services Association

PROJECT LEADER – CITY £7,000 + SUB MORTGAGE

International financial institution has a vacancy for a Project Leader to lead a team in a major new system development. Looking for someone with at least 18 months' supervisory experience leading to successful achievement of a significant project preferably in a financial environment. Must have ability to communicate well with all levels of people and able to make and act on decisions. They retain IBM hardware and run under DOS/VS.
* Continued development in a well-planned schedule.
* Scope in a variety of areas.
* Progressive organisation.
* Good company benefits which include sports and social club.

Ref 1762

SYSTEMS ANALYST – LONDON £7,500

Exciting and challenging opportunity awaits a systems analyst within this worldwide and prestigious company. Ideal applicant will have programming background in COBOL and ASSEMBLER and at least 2 years' systems experience. Our client is awaiting the installation of a new IBM 370 in October and this is a super opportunity to work in a brand new area on new projects.
* Super working environment.
* Excellent career opportunities.
* Recruitment of own team
* All new development work.

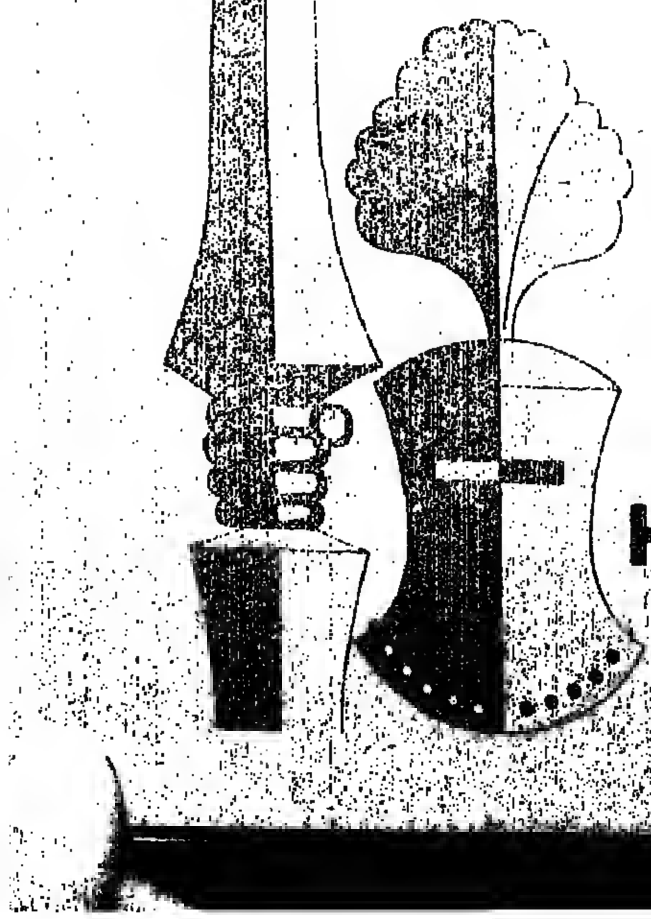
Ref 1818

CONSULTANT SOUTH ENGLAND £8,000 +

World-wide manufacturing company based in Southern England seeks 2 persons to work in capacity of Systems Engineer on a major on-line project — assisting in the development and installation of sophisticated terminal and communications systems. Ideal applicant should either have mini programming experience in ASSEMBLER, BASIC or MUMPS, and/or current systems house design and application software experience both in communications and real-time and commercial environment.
* Fantastic career growth and salary potential.
* Opportunity to do some marketing support besides client liaison.
* Opportunity for overseas travel.

Ref 18[illegible]

For further details ring our London Office 01-734 0152/3010 (24 hours)



KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1. TELEPHONE 01-734 0152/6 (24 HOURS)
OFFICES AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM.

KNIGHTS CONTRACT DIVISION

LONDON & HOME COUNTIES

PDP II MACRO + CORAL	MIDDX.
PDP FORTRAN	BERKS.
PDP MACRO II RSX IIM	GLOUCS.
PDP MACRO II RSX IIM PROG	C. LONDON
PDP MACRO II RSX IIM PROG	HERTS.
IBM OS COBOL	S. COAST
IBM OS TSO COBOL AN/PROG	HERTS.
IBM DOS CICS ASSEMBLER	S. LONDON
IBM COBOL + MARK 4	C. LONDON
IBM CICS ASS + PL/I	CITY
IBM IMS DB/DC PL/I	S. COAST
ANALYST FORTRAN	C. LONDON
FORTRAN + OS JCL	C. LONDON
HONEYWELL 6000 TDS COBOL	MIDDX.
BURROUGHS 6700 COBOL	SURREY

SIEMENS TELEPROCESSING	
ASSEMBLER + COBOL	LUXEMBOURG
IBM COBOL + NEAT 3 CONVERSION	HOLLAND
SYSTEMS PROG CICS PL/I + ASS	HOLLAND
MINI FORTRAN/PROCESS CONTROL	BELGIUM
FERRANTI ARGUS CORAL 66	BRUSSELS
UNIVAC DMS COBOL	HOLLAND
PL/I IMS/DB/DC	HOLLAND

MIDLANDS & NORTH

UNIVAC ASSEM PROG	NORTH-WEST
SINGER SYS IO ASS PROG	SCOTLAND
FERRANTI ARGUS 700 PROG	NORTH-WEST
HONEYWELL COBOL	SCOTLAND
ICL 2960/70 VMEB COBOL PROG	YORKS
PDP RSX II PROG	NORTH-WEST
IBM CICS ASSEM PROG	MIDLANDS
HONEY COBOL PROG	MIDLANDS/NORTH-WEST
ICL COBOL PROG ANALYST	YORKS
ICL 1900 G II/G III COBOL PROG	YORKS/NORTH-WEST
COBOL CICS PROG	NORTH
IBM 370 CICS ASSEM	NORTH-WEST
REAL TIME PROGS	SCOTLAND
PL/I PROGS	MIDLANDS
PL/I CICS PROG	NORTH/MIDLANDS
ICL S/WARE PROG	NORTH-EAST
HONEYWELL GCOS IDS/TDS	MIDLANDS/NORTH

Computing Services Association

FOR DETAILS OF THESE AND OTHER CONTRACTS CONTACT PERRY BUTLER, 143/144 ROYAL EXCHANGE, MANCHESTER. TEL. 061-833 9341/3, MIDLANDS 021-236 1794 x 223

KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1 TELEPHONE: 01-734 0152/6 (24 HOURS)
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

occ computer personnel limited

Middle East

Analyst Programmers
c £14,000 tax free plus benefits

Analyst programmers are required for a new computer department being established at a leading motor distributor in Saudi Arabia, which is due to take delivery of an IBM 370/115 in March 1979. The systems will initially be a mixture of batch and on-line, running under CICS and DOS/VS and written in RPG II.

Benefits
- ★ Free furnished accommodation
- ★ Free company car
- ★ Free medical treatment

Environment
- ★ Leading motor distributor
- ★ New 370/115
- ★ New DP department

Requirements
- ★ Solid systems and programming experience
- ★ At least 18 months' practical experience of CICS, DOS/VS, RPG
- ★ Self motivation
- ★ November start

Successful candidates will ideally have at least 18 months' practical experience of CICS, DOS/VS and RPG. There will be a high degree of user involvement and the positions will suit self starters. Experience of the distributive side of the motor trade would be an added advantage.

These positions are on bachelor status, enjoying the following benefits: 30 days' leave and 15 days' public holidays per annum. Free furnished accommodation of good standard with free electricity and water. Free medical treatment and company car.

FINAL CLIENT INTERVIEWS IN LONDON OCTOBER 16-17
To discuss these positions further, please telephone Marian Tabone on 01-242 9355 (day) or 01-555 5568 (evenings and weekends)

Computing Services Association

18 Berkeley Street, London W1A 1EE. 01-242 9355. Telex 21710.

Specialist divisions in UK, mainland Europe and Middle East computer departments.

GUINNESS

PROGRAMMER

The Guinness Computer Bureau, which services the computing requirements of Group Companies in [illegible] requires experienced programmers to work on the development of on-line, data base and operating systems.

Experience Required: The successful applicants will have at least two years' experience of COBOL. Special consideration will be given to programmers with experience of programming on-line systems or with knowledge of the ICL 2900 VME/B operating system.

Salary: Salary will depend on experience but minimal salary will be not less than £[illegible] p.a.

Conditions: 4½ weeks' annual vacation. Non-contributory pension scheme. Profit Sharing scheme. Assistance with removal expenses and other generous fringe benefits.

Apply to: The Manager, Guinness Computer Bureau, Guinness Ireland Ltd., St. James's Gate, Dublin 8.

Stating qualifications, age, education, experience, present salary, and quoting reference 31, not later than first post on 23rd October 1978.

SOFTWARE OPERATOR
Circa £3,900 p.a.

Barclays Bank has a vacancy for an Operator with an interest in software to work at Radbroke Hall near Knutsford in Cheshire.

The job will involve working with our Software Support Group to install, test and maintain the wide range of operating system software and packages that run on our IBM 370/168's and IBM 370/158's. Our current operating system is MVS, but VS1 is due to be installed.

Applicants for this position, which does not involve shift work, must have three years' experience of operating and have an in-depth knowledge of OS/JCL and Utilities. Knowledge of VM/370 and CMS would be an advantage.

The successful applicant would be expected to progress into software programming.

As well as the usual benefits of working in a large clearing bank, there is a non-contributory pension scheme, a profit sharing scheme, subsidised luncheon facilities, excellent sports and social activities.

Application forms may be obtained from:

Brian Bath,
Chief Clerk (Personnel),
Barclays Bank Limited,
Radbroke Hall,
Nr Knutsford,
Cheshire.
Tel: Knutsford (0565) 3888

BARCLAYS

CAD/CAM

COMPUTERVISION

PCB . NC . IC . MDD . BS308
Circa £8,500 p.a.

If you understand some of the above —
You may be a CAD Operator —
You may be technical contact at a bureau —
You will have some computer knowledge —
You must have PCB or mech. eng. design and/or manufacture experience —

You must be willing to travel to Europe occasionally.

If you are still reading and would like a better paid, more interesting, more demanding job in the forefront of practical CAD/CAM technology: contact Geoff Hall, COMPUTERVISION.

COMPUTERVISION are the world leaders in turnkey CAD/CAM.

We need two Applications Engineers to train and support our rapidly expanding customer base. One will be mechanically biased, the other will be electronically biased. Both will learn some of the other's work and practical CAD/CAM in depth.

Our customers are the biggest and best names in manufacturing industries all over Europe. They buy CV because it is the best — they expect the best support. So if you want to support the best in UK manufacturing, contact Geoff Hall, at COMPUTERVISION LTD., Computervision House, Rann Street, near Amersham, Bucks. Telephone Hollis Gr[illegible]

MINI SYSTEMS — SYSTEM DEVELOPMENT MANAGER

@ £5,000 + Company car and generous profit sharing

Morpres is about to expand into software support working alongside a major manufacturer of mini computers. The company will be moving into new premises in Enfield and new hardware will be available at the same time.

We are now seeking a senior D.P. Executive with a wide variety of experience in the industry covering mainframe/mini systems, including considerable experience in systems analysis, RPG II programming and management. A major factor will be the ability to cost and estimate man power resources for computer system implementations.

The successful applicant will be required to take over the total management of the software division and implement the long term policy of expansion already embarked upon.

Application in confidence to: Tim Gregory

morpres data processing limited

33 Crawford St., London W.1

KINGSTON POLYTECHNIC COMPUTER UNIT

SYSTEMS OR APPLICATIONS PROGRAMMER

Experience of communications programming [illegible] George 2U would be of particular interest. £4017-£4917 inc.

Application forms from Assistant Registrar, Kingston Polytechnic, Penrhyn Road, Kingston, Surrey KT1 2EE. 01-549 1366.

Online Opportunities with the leader... Telecomputing

Applications Design and Programming

Our client services teams continue to expand to meet the growing demand for our software product and project services. We need more experienced programmers and systems analysts/designers. Junior vacancies require at least one year ICL Cobol experience; in more senior positions your specific computer background is less important. All our work is for online systems but you can learn that after you join us.

Our teams have already implemented applications such as order entry systems, production engineering, stock controls and mail order. More are in the pipeline. There are opportunities at all levels. Continuous training will develop your skills and promote your career growth.

Open Days in the Manchester Liverpool area

Come and see us for an informal discussion on any of these vacancies at our new project centre near Manchester or at any of the Telecomputing centres in the U.K., Europe or Australia.

Wilmslow	Manchester	Liverpool	Wilmslow
Monday – 2nd October 9 a.m. to 8 p.m. at Telecomputing Bank House The Paddock Handforth Wilmslow	Tuesday – 3rd October 9 a.m. to 8 p.m. at The Grand Hotel Aytoun Street Manchester 1.	Wednesday – 4th October 8 a.m. to 8 p.m. at Holiday Inn Pandoss Street Liverpool 1.	Thursday – 5th October 9 a.m. to 8 p.m. at Telecomputing Bank House The Paddock Handforth Wilmslow

If you can't make it or want to make a specific appointment for one of these days please phone either Gordon Longworth on Wilmslow (09964) 32644 or Alan Walker on 0865 723621.

Project Managers and Consultants

Must have extensive experience in the design and development of online transaction processing systems.
Telecomputing specialises in implementing advanced systems using communications terminals. We operate internationally with every client bringing his own unique system requirements and we need the senior staff to design and develop those systems.

Software Design and Support

1900 2900 VME/B VME/K

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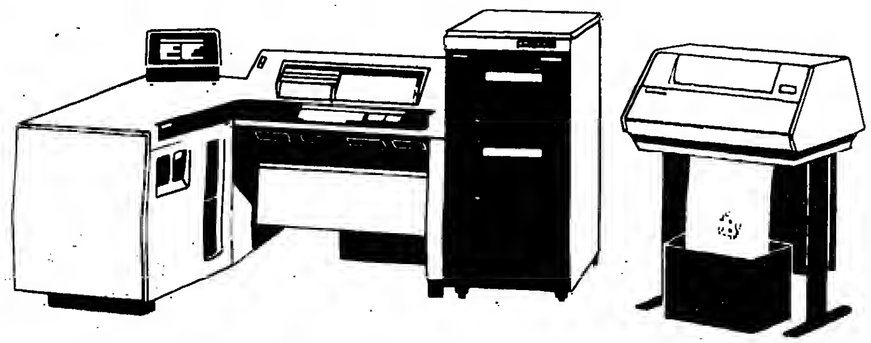
Telecomputing

Telecomputing started in Oxford in 1974 and has more than doubled in size each year. We are now providing advisory, training and implementation services for installing online computer systems around the world.
We have our own 2904 and a 2850 on order. Our activities are continuing to expand and we shall soon announce a microcomputer display terminal. This year we shall double in size again!
When you join Telecomputing you are taking the opportunity to develop your own career in a growth company. We have an informal atmosphere and expect to pay attractive salaries and bonus.

For vacancies at any of the Telecomputing centres please write or phone:
Alan Walker TELECOMPUTING
Seacourt Tower, West Way, Oxford OX2 0ED
Phone Oxford (0865) 723621 (day)
or Goring-on-Thames (04914) 3349 (evening)

Software Engineers to develop Products of the 1980s

The successful Burroughs B80 was designed by a strong joint HARDWARE/SOFTWARE team in the new town of Cumbernauld in Scotland. The system software includes a full multi-programming, virtual memory operating system plus communication software, compilers, utilities etc.



We are now looking for Software Engineers/programmers to design and develop STATE-OF-THE-ART SYSTEM SOFTWARE for the next decade of Burroughs Computers.

OPERATING SYSTEMS ● MICRO PROCESSORS
COMPILERS ● REAL TIME SOFTWARE
DATA COMMUNICATIONS
I/O HANDLERS ● DATA BASES

The people we are looking for should have experience in one or more of these areas and be ready to take on considerable technical responsibility. However, we'll still be interested in talking to you if you have other experience which could be relevant. Many projects will provide opportunities for travel to the USA and Europe.

The New Town offers speedy access to both Glasgow and Edinburgh and excellent inexpensive modern rented housing is available. Or live on the edge of the Highlands in Stirling, Dunblane or Bridge of Allan — just 20 mins. away.

Let us tell you more of our plans.

'Phone 023-67-31529 (reversing the charges) any weekday between 8.30 and 4.30 or until 7.00 p.m. on Monday 2nd October and Tuesday 3rd October. Please mention this advertisement to our secretary and she will connect you to one of our managers for an informal chat.

Alternatively if you prefer, write to:
Software Engineering Manager, SSD/A, Burroughs Machines Limited,
Cumbernauld G68 0BN, Scotland.

Burroughs

PLEASE READ THIS

We at CMG cannot understand why you have not applied to us yet for a job.

Perhaps you see our ads so often that you have stopped reading them.

We do advertise frequently but we do need a lot more staff to achieve the £4,000,000 of growth planned for this year.

Perhaps you do not want to work in the Service Industry.

The Service Industry is different and you either love it or hate it. We love it—perhaps you would.

Perhaps you do not believe the high salaries that we offer.

We have recently been named as the fifth highest wage payer of the top 1,000 private companies in the UK.

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We require computer professionals with a minimum of 2 years' commercial systems and programming experience. At the top end of our scales we are looking for solid consultancy and management experience as well. We have a wide range of salaries (£5,000 to £12,000) because we have a wide range of requirements.

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We offer a wide variety of challenging work from programming through to consultancy. We work with minis and mainframes and with a variety of customers and applications. All promotion is from within and is based purely on ability. Our commitment to growth ensures excellent promotion opportunities. The CMG atmosphere is both professional and informal and everyone is encouraged to participate in the affairs of the company. There are profit-sharing and share-purchase schemes.

Perhaps we will hear from you soon.

If you would like to telephone for more details you may do so during the day or on 01-657 3798 in the evening or at the weekend.

Pete Startup
Managing Director
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Tel: 01-686 8251

oyez

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You will be working ONLINE to PDP 11/34 & 35 minis, mainly on pure development projects. Successful applicants will have ample opportunity for involvement in Systems Analysis, and possibly in client contact and travel too.
The minimum requirement is 12 months' BASIC + (or BASIC), preferably under RSTS. Any ONLINE experience will also be useful.
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TO £7,500 p.a. plus COMPANY CAR

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Following the promotion of the former head of department to Assistant Director within the Polytechnic, a vacancy occurs for a person to take charge of this important department.

A dynamic well qualified computer scientist with wide experience of both the theory and practice of the subject is sought to lead an enthusiastic team in teaching and research.

The Polytechnic is expected to designate a number of professorships for academics of distinction who meet certain criteria. The successful candidate for the post may be eligible for consideration.

Salary within scale £8,643 to £9,603 per annum.

Application forms and further particulars may be obtained from the Staffing Office, Teesside Polytechnic, Middlesbrough, Cleveland, TS1 3BA, returnable within 14 days.

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Systems Programmer £5,500
Programmers £5,000

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Appointment to the Computer Department of the Grampian Health Board

SENIOR SYSTEMS DESIGNER
Salary £8537-£8715

Due to an internal promotion the above vacancy exists at the Grampian Health Board's Computing Centre, Foresterhill, Aberdeen. The Grampian Health Board is responsible for the planning and overall control of Health Care Services for a population of almost 460,000 people in the North-East of Scotland.

Candidates should have considerable experience of computer systems and program development. The work involves the development of a medical information system (using a data base), financial and budgetry services and the development of distributed processing using small machines.

The equipment consists of an ICL 2904 and 2903, a CTL Modulet 1, a micro-computer and access to the Honeywell 66 belonging to Aberdeen University.

Application forms and further particulars of the post may be obtained from the Area Personnel Officer, Grampian Health Board, 1-7 Albyn Place, Aberdeen AB8 1RE, telephone 0224-29801 (ext 3227) to whom completed forms should be returned by Monday, 16th October, 1978.

ASSISTANT DATA PROCESSING MANAGER

£6,000 + CAR

A vacancy exists for an Assistant O.P., Manager in our small O.P. Department at Elswick in Bedfordshire. The successful applicant will probably be an Analyst/Programmer with several years' experience on small IBM Computers using RPG II and should have implemented at least one major system, preferably on-line. The main area of responsibility, apart from deputising for the D.P. Manager, will be in developing an on-line stock control and invoicing system for a distributed network of small computers in our branches throughout the country.

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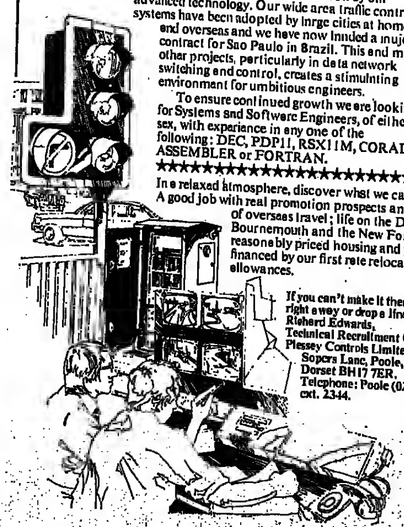

If you can't make it then, ring right away or drop a line to:
Richard Edwards,
Technical Recruitment Officer,
Plessey Controls Limited,
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Telephone: Poole (0203) 5161 ext. 2344.

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with a background in the maintenance of microprocessor and mini computer systems and peripherals.

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The Caledonian Hotel Watford
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We'll interview you in London, Birmingham or Manchester.

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Computing Services Association

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£2878-£2987 plus £312 supplement p.a. + shift allowance

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Senior Computer Operator
with large systems experience

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£3464 + 12½% shift allowance

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The post is based in our modern air-conditioned offices in Southampton and relocation expenses will be paid where appropriate.

The Company is at present undertaking a review of salaries, which will be effective from 1st October and offers, in addition to the salary, an attractive range of fringe benefits.

Please write or telephone for an application form to: Mrs. I. Lisney, Assistant Personnel Officer, ACT Services Ltd., Richmond House, Terminus Terrace, Southampton. Tel. (0703) 34433.

ACT

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We expect them to heve e wide range of business end computer skills with the personal competence to understand user problems end to be eble to define realistic solutions and timescales by using their analysis, design, programming and menagement experience. They ahould also have the personality to supervise teams of people with the managerial confidence to implement systems to the client's setisfection within the full budgetry responsibility in their charge.

PROJECT/TEAM LEADERS — Salaries to £8,500

To contribute to our continuing expansion and success in the medium to large IBM and ICL 2900 project markets, we require experienced and enthusiastic people who are self-motivated and keen to increase their knowledge and experience as Project/Team Leeders. Our Project/Team Leeders are responsible for the supervision and motivation of teems of professional staff designing end implementing major systems for our clients. In addition to the technical involvement, the Project/Teem Leeders will work closely with their Project Manager and their team to insure that all schedules ere met and thet the teem have all the necessary resources to complete their tasks. His personal attributes should include a strong technical knowledge of IBM 370 and ICL 2900 systems and COBOL programming, coupled with a background in analysis and systems and program design and specification writing. He or she should have implemented at least one major system end have a strong desire to succeed in a demanding and highly rewarding environment.

SENIOR PROGRAMMERS — Salaries to £7,500

Senior Programmers are needed to provide the expertise and in-depth experience essential to the successful implementation of commercielly complex and technically challenging projects. Our Senior Programmers need a professional ettitude towards their work with e strong in-depth knowledge of IBM 370 DOS or OS or ICL 2900 VME hardware and software end sound ebility in COBOL Programming. They should also have a thorough understanding of program design end specification techniques and a record of successful program and system implementation in a project environment.

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Self-motivated programmers with e professional ettitude towards their work and the desire to expand their knowledge of programming end design of systems skills are required to work in a project environment alongside really top data processing people. If you have at least 18 months COBOL experience on any computer with a high degree of fluency in the lenguage end perhaps some enalysis experience then, there is a place for you on one of our project teams. Come and see how you can expand your horizons.

Marcol's record of implementing well over £2,000,000 worth of IBM and ICL medium and large scale projects in the last year successfully speaks for itself. Our involvement with our clients covers much more than programming — like systems research and evaluation, design, customer education and training, consultancy end implementation management. Why not come in end join in our success? If your background or ambitions fit any of the above jobs or if you think you can achieve one or more of them in a year or two, then we want to meet you to discuss your future with Marcol.

Projects are commencing shortly for both the U.K. end Europe and preference is given for overseas work to our existing staff but our current requirement end commitments will give you an opportunity of working in Europe within six months, if you want to. Retraining in eg. 2900 VME will be given.

We want you on our team . . . for full details on these jobs and meny more contact JIM FORT or PENNY BAILEY on 01-402 9355

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LOCATION: EPPING, near SYDNEY, AUSTRALIA, with some travel to the 3.9 metre telescope near Coonabarabran, NSW.
COMPUTERS: INTERDATA MODEL 70 minis, plus a 32 Bit machine soon to be ordered
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QUALIFICATIONS: Degree in Science/Maths subject. At least 3 years' programming
STARTING SALARY: Dollars 10469 to Dollars 16368 P A.
TO APPLY: Give full account of relevant education and experience, personal details such as age, marital status, country of residence, interests and the names and addresses of three referees, to The Director, PO Box 296, Epping, NSW 2121, AUSTRALIA
CLOSING DATE: 26th October, 1978.

FURTHER INFORMATION: Contact C. J. CHADWICK, Science Research Council, PO Box 18, Swindon, SN2 1ET. Tel. Swindon (0793) 26222, ext. 2226. Or the Director at the Observatory.

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MIDDLESEX £7000

Database, on-line program development, and RJE; three areas in which our client's D.P. future will be concentrated. Major systems development is planned for the next five years, and they are currently seeking an enthusiastic person to assume responsibility for guiding the efforts of the programming team, and help steer the company into the 1980's.

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Conveniently placed for the M4, M40 and public transport this is a first-class opportunity to join a company with an exciting future and a strong commitment to D.P. Excellent opportunities for career advancement within the group and a generous starting salary make this an ideal opening for a person keen to progress their career.

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Grade PO1b £5,868-£6,549 + £312 (Under review)

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Application form and further details from The Personnel Officer, Sunfield, Beacon Road, Crowborough, East Sussex TN6 1BA

Closing date for applications: October ... 1978

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At present, we see you as an operator plus — someone whose experience and intelligence is fast outgrowing just another ops job, and who knows George III at job description writing level.

As well as the salary we've quoted, we can offer you the chance to gain 2900 experience, plus the general experience that could be your springboard into operating management.

Lorraine Cathersides will tell you more. Phone her on 01-921 6047.

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Ring 051-236 7711 (24 hours)

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Applicants must have approx. 2 years' experience in mumps-11 and a good education.

The configuration is PDP 11/70 using mumps. The position involves considerable independence and responsibility.

Attractive benefits include free canteen, 4 weeks' holiday, sports/social club with own holiday facilities and others.

Write or phone

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ANALYSTS AND PROGRAMMERS

LOCAL INTERVIEWS FOR LOCAL JOBS

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Major opportunity in a progressive company. These are ground floor appointments in a new installation and new systems under development will include on-line, real-time and distributed processing. (C/78071)

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COBOL programmers also required and positions and salary will depend on qualifications and experience of the successful candidates. (C 78072)

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Senior Analysts c.£6000
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Minimum of 7 years experience of COBOL and ASSEMBLER. Experience of all types of file handling, database and CICS. Previous supervisory experience leading more than one applications team an advantage. (C 78074)

Please write or telephone Ivor Norton in confidence to arrange your local interview.

THESE ARE SPECIFIC VACANCIES FOR WHICH WE HAVE BEEN RETAINED BY THE CLIENT COMPANIES.

Ivor Norton Management Services Ltd
Recruitment Consulting Division
P O Box 63 Copthall Tower House, Harrogate HG1 1TS. Tel Harrogate [illegible]

INTERACTIVE COMPUTING

Rutherford Laboratory

The Engineering Board of the Science Research Council is setting up a national Interactive Computing Facility. Based on a network with major nodes at Chilton, Edinburgh and Manchester, the computing equipment includes a twin-processor IBM 360/195, two DEC 10's, a Prime 400, a GEC 4070, a III FR80 colour microfilm recorder and numerous other computers and peripheral devices. Several more multi-user minis will be purchased this year and added to the network.

Systems Programmers

You will be joining a small team engaged on designing, writing and updating systems software for multi-user mini-computer systems. The main areas of work include communications software associated with the network, software for a range of graphics devices and enhancements to the operating systems, utilities and compilers.

Depending on qualifications and experience, grading and salaries will be as follows:

Scientific Officer	£3,037 — £4,724
Higher Scientific Officer	£4,388 — £5.829
Research Associate (fixed 3 year term)	£5,500 — £8,000

We are prepared to offer accommodation and the posts are based at the Rutherford Laboratory, Didcot, which is situated within pleasant rural surroundings on the Berkshire Downs.

We provide daily travel facilities to most of the neighbouring towns and villages, and Rutherford has its own restaurant and recreation facilities, while at the adjoining AERE Harwell Site, you can enjoy the full benefits of the shops, banks, sports and social clubs.

Please write for further details and application form, quoting reference number VN732 to Ruth Jeans of the Personnel Group. Closing date for applications 13 October 1978

RUTHERFORD
Science Research Council
Rutherford Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX. Tel Abingdon 21900

BIRMINGHAM PROGRAMMERS

STARTING SALARY c£5,000

PL/1 OR ASSEMBLER

SCR have been asked to recruit programmers on behalf of a major International Manufacturing and Distribution Organisation based in Birmingham.

The company currently utilise sophisticated IBM hardware and are heavily committed to advanced techniques including IMS and the development of DISTRIBUTED PROCESSING.

If you are tired of a boring maintenance role or feel that you are stagnating within your present company, then we believe we have found the perfect opportunity to become involved in the development of interesting applications including IMS.

We are seeking the following skills
* a fluency in either PL/1 or ASSEMBLER (although other languages will be considered).
* sound commercial programming experience.
* the capability of contributing effectively within a small team.

We believe these opportunities to represent excellent career progression within a well-established and expanding Management Services function. It is emphasised that there will be continued training in both technical and managerial aspects for the successful applicants.

Please contact me at the Birmingham Office in order to arrange an interview in either London, Manchester or Birmingham.

Ring Andy Carter 021-236 3781

SPECIALIST COMPUTER RECRUITMENT LIMITED

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LONDON 01-935 0671
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Computing Services Association

LEICESTER CITY COUNCIL
PERSONNEL AND MANAGEMENT SERVICES DEPARTMENT
Computer Service Division

Senior Programmer

Up to £5588 per annum

The holder of this post will be required to make an effective contribution to the implementation of projects which include expansion in the Teleprocessing field and have the potential to develop into a Senior role. Applicants should have extensive experience in programming and a thorough knowledge of COBOL and/or BAL. Experience in the supervision and training of programming staff is essential.

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Up to £5073 per annum

As well as the ability to write and test COBOL programs, a minimum of one year's proven experience is required. Experience of BAL, CICS/VS, VANDL/1 (or DL/1) would be an added advantage. Applicants with less than the stated experience may be considered for employment as Junior Programmers and any necessary training will be given.

Starting salary will depend upon experience. A system of Flexible Working Hours is in operation and aids to relocation expenses are available in approved cases

For further details and an application form, please write to the Director of Personnel and Management Services, New Walk Centre, Welford Place, Leicester LE1 6ZG, or telephone Leicester (0533) 549922 extn. 7084.

Closing date for receipt of application forms 12th October, 1978.

LEICESTER
Right of the centre

OPERATIONS SUPERVISOR

£4660-£6130 p.a.

The North-Western Region of the Central Electricity Generating Board is looking for a suitable person to join the staff at the Computer Branch which is situated in pleasant surroundings in Bramhall, Cheshire.

The Operations Supervisor is responsible for the efficient day-to-day running of the computing equipment and for the supervision of the computer operating and job control staff who work both day and shift pattern.

The computing equipment in the Region, at present, includes a 192K ICL 1904S computer operating system and an ICL 7905 communications processor.

The 1904S is to be replaced in 1980 by a 2.5 Megabyte ICL 2960.

A thorough knowledge of computer operating using an advanced operating system is required together with experience in operation of large-scale communications facilities.

Applications in writing, from either sex, giving details of age, experience, qualifications, etc., to the Personnel Manager, C.E.G.B., Europe House, Bird Hall Lane, Cheadle Heath, Stockport, Cheshire SK3 0XA, to arrive no later than 9 October, 1978. Please quote vacancy number 229/CW.

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All-purpose computer professionals are required with experience in programming or system analysis, or both. It would be an advantage to possess some knowledge or experience of accounting/financial packages. The positions offer involvement in a number of the following areas:

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Experienced Sales Staff are also required to meet the expansion of business. They should have knowledge of accounting systems and preferably interactive processing. The positions offer a high basic salary plus commission, with a company car, and good promotional prospects.

Phone: B. R. Lock or H. Shopper, Watford 38321

BCC Boeing Computer Centres Ltd
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Further information from:
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Slough College of Higher Education
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Telephone:
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The Polytechnic of North London

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Salary on scale rising to £3601 per annum

Are you a capable secretary with five "O" Levels or equivalent, some audio experience, no shorthand, interested in typing technical documents to a high standard? If so, please write giving full details of age, qualifications and experience to the Establishment Officer, Polytechnic of North London, Holloway Road, London N7 8DB.

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Shell require IBM Software Support Staff

Shell U.K. Ltd. at Wythenshawe, near Manchester, require experienced technical staff to work on two large IBM/370 158s running under MVS/JES2 supporting an ambitious program of development for RJE, ROSCOE, RACF, VTAM/NCP, IMS DB/DC services.

HEAD OF THE IBM/MVS SOFTWARE SUPPORT GROUP

You will have at least five years' proven technical and administrative ability with large IBM system software and online systems. You will have a strong sense of commitment and responsibility, experience in the management of technical systems, projects and staff.

You will be responsible for the management and support of the systems software and budgets and have a strong role in developing software and hardware plans.

HARDWARE/SOFTWARE SPECIALISTS

You will have at least two years' experience as a systems programmer, software support programmer, or hardware specialist on large IBM configurations, with a proven ability to assume responsibility for the implementation and support for areas within your technical speciality.

We offer excellent prospects for the future together with a competitive salary commensurate with the position plus the usual fringe benefits you would expect from a large organisation. Substantial relocation expenses will also be paid where applicable.

Male/female applicants should write for an application form to:
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SHELL U.K. LIMITED
Rowlandsway
Wythenshawe
MANCHESTER M22 5SR
Tel: 061-499 4454

Shell

CITY OF BIRMINGHAM POLYTECHNIC

SENIOR PROGRAMMER

(2 posts) £4245-£4832 (inclusive)

Two Senior Programmers are required in the Computer Centre which operates an ICL 1902S (32K) and is proposing to install other computer equipment.

A working knowledge of at least two languages and experience of Educational Computing would be an advantage.

Further details and application forms (to be returned within 14 days of the appearance of this advertisement) from

The Personnel Officer,
City of Birmingham Polytechnic
F. Block, Birmingham B42 2SU

THE CITY UNIVERSITY

Experimental Officer

required for our Department of Systems Science to carry out work in a laboratory which is used for research and teaching on computer controlled process rigs, automatic inspection techniques, interactive design and interactive teaching programmes. Applicants should preferably have experience of PDP.11 computers to assist with the interfacing and operation of the computer installation and degree level qualifications are desirable.

Salary will be on the scale £3834 to £6054 per annum inclusive; 36 hour week; 34 days' annual leave including public holidays. The University also provides cafeterias and recreational facilities.

To apply please write to the Personnel Office at the City University, St. John Street, London EC1V 4PD, or telephone Mrs. K. Fowler on 01-253 4399 extension 834.

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£4,000-£8,000 PLUS

I am seeking Software Programmers to join a European Team developing a set of software products for my client's own range of minis. I wish, therefore, to hear from people with experience in any one of the following fields.

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— TP MONITORS
— DATA BASE DEVELOPMENT
— SOFTWARE INTEGRATION
— COBOL PROGRAMMING

I shall be happy to have confidential, noncommitel discussions by telephone or face-to-face. If you would like to investigate, please telephone me, Tony Baker, on 01-499 4501.

RW 39/1

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SW London

c. £7,000 + Car + Benefits

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HAVE YOU MANAGEMENT POTENTIAL?

My client markets intelligent peripheral products that are sold worldwide. One of the main markets for this product is in the financial sector.

They wish to augment the support team with an experienced analyst/ programmer capable of accepting pre- and post-sales responsibilities for a range of products. This will involve a high degree of customer contact, running benchmorks, developing applications and modifying machine software, etc. Business systems analysis and COBOL programming experience are among the breedth of skills required to make a success of this challenging role.

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Ref. CW 39/2

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01-499 4501

RW 39/3

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In addition to a rewarding and totally absorbing job your office will be only a short drive away from the rural villages of South Hertfordshire, whilst at the same time having the benefit of excellent communications to Central London, the West of England and the Midlands.

These posts are bound to be popular so why not phone me, GEOFF MARSH, on 01-499 4501 NOW to see if you match up.

Ref. CW 39/1

hutchinson-scoggins recruitment
47/48 New Bond Street (entrance in Maddox Street) London W1Y 0HE Telephone 01-499 4501

PL1 PROGRAMMERS

West End — **to £5500 + Mortgage**

A leading commercial organisation with an expanding 370/135 installation in the West End is seeking a number of PL1 programmers to work on a variety of new and existing projects.
The positions are ideal for enterprising young programmers with at least twelve months experience on IBM Hardware. A knowledge of OS/VS1, although not essential, would be a distinct advantage. The company offers a first class salary, and the many generous fringe benefits include Flextime, Season Ticket Loans, and a Subsidised Mortgage.

Reference JC 34/1

RPGII PROGRAMMERS

City — **to £4500 + Mortgage**

A leading international bank based in the City requires a number of capable programmers to join a team involved in both the expansion of current systems and the development of new projects on their IBM SYS 34.
The company is interested in ambitious young individuals who wish to add to their experience and expertise and who have at least 6 months experience of RPGII programming.
An attractive salary is coupled with a first class benefits package which includes cheap loans and a subsidised mortgage plus all the other advantages normally associated with working for a bank.

Reference JC 39/2

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GII or Manuel experience required for this City installation. 3 Shifts. Perks include Bonus, BUPA and Subsidised Mortgage.

ICL 1900 GII — **£4300**
One year's experience necessary. 3 Shifts, 5 days a week.

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6 months+ experience required for this travel company. Perks include cheap holidays and flights.

IBM 360 DOS — **£4000**
Op + Snr Op for progressive manufacturing company. Good prospects for early promotion to Shift Leader. 2 Shifts only.

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18 months + experience with some JCL knowledge for Central London installation.

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Minimum of 2 years experience necessary for this post. 2 Shifts limited nights.

BURROUGHS 3700 — **£4600**
Snr Op with 18 mths experience needed for this job with excellent career path + perks.

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Snr Op with a minimum of 2 years experience for this post on NCR's new range. No nights and perks include cheap loan and mortgage.

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If you have experience within either Systems & Programming, or Operations, and would like more information, please call Phil Gascoigne.

Reference PG 39/3

COBOL PROGRAMMERS

Kent — **up to £5000**

A well established company with strong links to the City of London is seeking additional programming staff for its expanding installation in Kent.
The hardware currently in use is the ICL 1900 range running under GEORGE II and the personnel they require should ideally have a minimum of one year's COBOL experience, preferably on ICL equipment, but other manufacturers' hardware will also be considered.
In addition to an excellent starting salary, dependent only upon ability and experience, the company offers attractive working conditions and a generous benefits package.

Reference JC 39/4

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METROPOLITAN BOROUGH COUNCIL

Borough Treasurer's Department

SYSTEMS ANALYST (2 POSTS)

(SO.2 £5,415-£5,748 plus £312 p.a. supplement)

Experienced Systems Analysts are required, preferably with commercial systems and/or local government background to work on continuing development projects in an I.C.L. 1903T/7903 Computer Installation. A knowledge of real-time T.P.S. and/or George III would be advantageous.

Closing date 5th October, 1978.

Application forms available from and returnable to:

Chief Personnel Officer
Personnel Department
7 Northumberland Square, North Shields
Tyne and Wear

ICL TECHNICAL PROGRAMMER

A Senior Person with experience of MAXIMOP, FORTRAN or ALGO and PLAN on ICL 1900 to assist an existing client located 30 miles north of London with the implementation of a data comms systems and staff education.

Either a permanent position on our staff or 3-6 months contracts envisaged. Contact Chris Phillips or Ian Gold on 01-388 0036.

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The Centre provides an extensive and sophisticated service to research and teaching in the College and to other institutions in the University of London. The service is based on two powerful central data computers, A CDC 6600 and a Cyber 174. Linked to these are a CDC 1700, two DG Novas, and a Modcom, which also provides links into Metronet, the University of London Computing network, and eventually into a national network.

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A three-shift system, Monday to Friday, is currently in operation.

Applications are invited for the following positions

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Minimum of two years' experience of computer operations is required. Further training is provided. Starting salary in the range of £3,529 to £4,224 plus shift allowance of £509 per annum.

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Previous experience not necessary as full training will be given. Applicants should be at least 19 years of age, preferably with "A" level standard of education. Starting salary in the range of £2,864 to £3,997 plus shift allowance of £506 per annum.

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Further details and application form can be obtained by writing to M. P. Olroy, Assistant Computer Manager (Operations), Imperial College Computer Centre, Mechanical Engineering Building, Exhibition Road, London SW7 2BX. Or ring 01-589 5111 Ext. 1177.

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- Knowledge of computer system configuration
- Field installation and commissioning experience

Responsibilities will include the preparation of engineering proposals, technical system evaluation with clients and suppliers, and engineering involvement through to job commissioning.
Although based in the UK, some travelling overseas will be required. A degree/HNC is preferred but consideration will be given to others with extensive experience.
A salary will be offered commensurate with the importance of this position, together with an excellent range of company benefits. Relocation costs will be paid where appropriate.

PERSONNEL ADVERTISING LIMITED
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Business Systems Analyst

C. E. Heath & Co. (Agencies) Ltd.

circa £6,000

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The person appointed will report to the Management Services Manager of the Agencies Company and the position will be located in the administrative offices of the Company at Southend-on-Sea.

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In addition to salary terms, conditions of employment include a contracted out non-contributory pension scheme, subsidised luncheons and free life assurance. A system of flexible working hours on a 35 hour week basis is operated.

Please telephone for an application form to:

Mr. P. F. NERRETER, Personnel Officer,

C.E.Heath & Co. Ltd.

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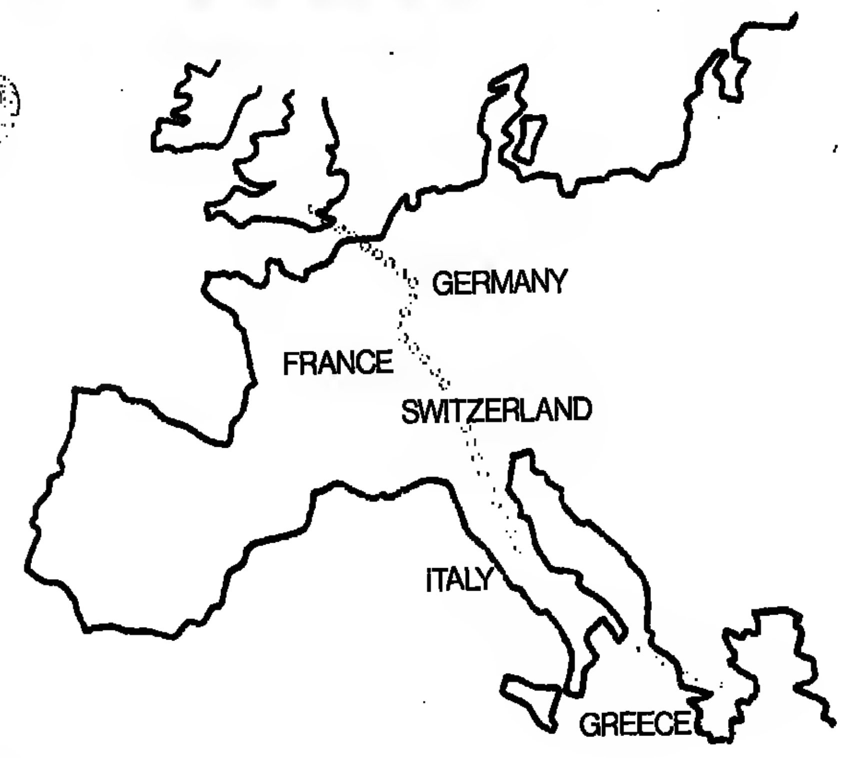
PROGRAMMERS

Follow the audit trail across Europe



We are looking for a programmer who can "grow" into an EDP — Auditor within 18 months, for the European Division of a world-wide Financial Services Group. Nearly half your time will be spent travelling in Europe to Germany, France, Switzerland, Italy, Greece . . . Home base will be in the South of England.
This is a challenging position because, in addition to a range of technical skills, the programmer must have a good "presence". The department is responsible for computer Audits and the development and maintenance of supportive software — performing a Quality Control and Systems Assurance role.
A detailed knowledge of IBM COBOL is needed — ideally with some Assembler and RPG — gained in an OS environment.
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Other benefits included are non-contributory pension and free Life Assurance. Full removal expenses will be paid and the company gives all the training needed to offer you satisfying career development.

Final interviews will be held in New York

Please contact Joan Ainsworth on 01-242 9356 (24hr. answering service) quoting ref: 745 CW

Computing Services Association

Vitamealo (Keynsham)

Data base Administrator

This is a new appointment based in the recently completed office building at our Keynsham production unit.

The administrator will be concerned with and ideally should have some knowledge and experience of computer systems.

Reporting to the Vitamealo accountant, responsibilities will include the supervision and maintenance of up-to-date data storage within the system as well as the organisation and supervision of data extraction.

Qualifications should be at HND level in Business Studies, and applicants should be mathematically orientated, with computer work as a career choice. Three integrated installations are used within the company.

This is an ideal opportunity for a young person of either sex, with some experience to develop a specialised service to management groups within Vitamealo.

The full range of Beecham Benefits apply which include non contributory pension and life assurance schemes.

Letters of application to M. J. Winter, Beecham Animal Health, Broadmead Lane, Keynsham, Bristol

Beecham Animal Health

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★ **Programmers (PL1, DL1)**

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Expansion during 1978/79 will include:
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This initial people investment brings:—
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If you have experience in the Data Communications Field **(Modems, Multiplexers, Network Systems, etc.)** or solid data processing experience **(peripherals, minis, micros)** and feel that you can handle the challenge of one of the above position based in S.E. England covering the whole of the U.K. then don't delay!
Call now.
Ref. CS 1106

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NEW ZEALAND

The Computer Services Division of the New Zealand State Services Commission has the following vacancies for staff experienced in developing and maintaining major systems on large scale equipment and data communications networks

Senior Systems Analysts/Systems Analysts
(Salaries up to NZ $14,000)

Senior Systems Programmers/Systems Programmers
(Salaries up to NZ $14,000)

Senior Programmers/Programmers
(Salaries up to NZ $13,000)

Positions are available at
Wellington —
both the Pipitea and Cumberland Computer Centres situated in central Wellington.
The Pipitea centre operates a dual Burroughs B 4700 supporting a nationwide network of Hewlett Packard terminals.
The Cumberland Centre operates an IBM 168 running under MVS and using TSO and IMS.
Wanganui (West Coast North Island) — if you feel the change from the large city environment, this centre offers large system operating dual Univac 1100s with an expanding network in an ideal provincial setting.
Assistance will be provided to staff recruited in U.K. and their family and household affects to New Zealand.
The Manager of the Division's Pipitea Computer Centre, Mike Foden, will be in London in late October and will be conducting interviews.
Applications giving full details of age, experience and family should be addressed to the Chief Recruitment Officer, New Zealand House, Haymarket, London SW1Y 4TQ. You should quote reference in your enquiry.

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SENIOR PROGRAMMER/ ANALYST TO £7,300

We have a vacancy for a Programmer/Analyst with experience in any of the following areas: information processing; numerical analysis; statistics; language design.

The person appointed will work in the area of academic support and will be involved in the design and implementation of interactive computer systems.

We maintain a large time sharing network based around DEC 20 computers.

Applicants should have a number of years experience in computer system design and implementation and educational qualifications up to degree level.

Interested applicants should ring the Systems and Programming Manager on Milton Keynes 63424 for further details.

Application forms are available, by postcard request please, from The Recruitment Office (JO617/ , The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or telephone Milton Keynes 63404. There is a 24-hour answering service on 63868.

Closing date for applications: October 5, 1978.

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58 New Street, Birmingham B2 4DU, 021-643 0951
or Tel 01-723 5334

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That he wanted, with an increase in pay.

*For Programmer also read Systems Analyst, Operator, Project Leader, D.P. Manager, etc.

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Prog/Analyst (DEC/DOS)	£5.5K+
Progs (vars.)	£4-£5K
Operators (DOS/IBM)	£Neg.

GLOS/WILTS	
Realtime Progs	to £6K
Snr. Anal./Prog. (RPG II)	£5.5K
Progs (ICL)	£5K

SOUTH WALES	
Ops Manager (IBM)	£7K + Car
Systems Anal. (IBM)	£6.5K
Anal. (Prod. Control)	£5.9K
Realtime Progs.	To £5K
Junior Progs (Cobol)	£4K

SOMERSET/DEVON	
Anal/Prog (RPG II)	£5K
Snr. Anal./Prog (Cobol)	£5K+
Analysts (IBM)	To £6K
Progs (ICL)	£4.5K

If you've decided the same, check our selection of current vacancies with Companies in the South West and South Wales. For further information about career opportunities in these areas contact Keith Dawe or Chris Wilson.

Sanderson EXECUTIVE RECRUITMENT
9A Princess Victoria Street Clifton Bristol
TELEPHONE 0272 39302

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

(University of London)
Keppel Street WC1E 7HT

TUC CENTENARY INSTITUTE OF OCCUPATIONAL HEALTH

COMPUTER PROGRAMMER

is needed to carry out data processing and computer programming within the Institute and to give computing assistance to staff and postgraduate students. Applicants should be experienced in the use of packaged programs for analysing survey data. A working knowledge of FORTRAN and some familiarity with statistics are desirable. The gross salary (under review) rises to a maximum of £4381.

Applications, stating full career and education details and naming two referees, should be sent to Secretary (A1) at the School.

KENT COUNTY COUNCIL

HIGHWAYS & TRANSPORTATION DEPARTMENT

COMPUTER PROGRAMMER

£3279-£4146 inclusive

for the Transport Planning Group to assist engineers in the use of existing programs including preparing, running and analysing particular jobs, to write programs required in the analysis of traffic data, and to provide general computing advice to members of the Group. Some experience of FORTRAN is desirable. Facilities include a remote batch terminal to both the County computer and commercial bureau.
Application form returnable by 17th October from the County Surveyor, Kent House, Lower Stone Street, Maidstone (Ref. P4265).
Interview date 26th October.

occ computer personnel limited

City

Programmer
£5,000 + Bonus

ICL PLAN and COBOL:
Stock Exchange applications

A well-established and leading firm of Stock Jobbers currently uses the services of a bureau to run a number of share dealing and accounting systems. A second programmer is now required to support and enhance existing programs which are written in PLAN, and to write new COBOL programs allowing for further developments within the stock market.
The person appointed will have at least three years' commercial programming experience preferably in a financial environment. Stock Exchange experience would be particularly relevant. The ideal candidate will have both PLAN and COBOL experience; however, a good PLAN programmer who has not used COBOL may still be considered.
The company offers excellent working conditions and benefits include an annual bonus, non-contributory pension scheme, BUPA, luncheon vouchers and 4 weeks' holiday per annum.
Ref: 744/CW/Marian Tabone

Sales

Mini Computers
c£14,000 + car

London & South-East

Our clients, a new subsidiary of an established American Company, have been marketing in the U.K., through distributors, for several years and already have subsidiaries in most European countries.
Their expansion plan will offer exceptional opportunities to successful Sales Executives with relevant experience. The product is a REAL TIME disc based mini computer with a reputable operating system and comprehensive software offered to a commercial market as a series, often installed with terminals.
We are seeking Sales experience on VRC and/or accounting machines or small systems hardware or turnkey systems sale in a commercial business application market.
Ref: 531/CW/Renee Nute
Opportunities also exist with other computer manufacturers for first class sales executives with small or large systems selling experience. Mostly London and Home Counties.
Ref: 532/CW/Renee Nute
If your experience is suitable, please ring informally for a discussion or to make an appointment.

Software Development

Norway
£10,000-£15,000

Opportunities are available for involvement in the development of software systems on a new range of equipment for a Norwegian computer manufacturer. They are looking for experience in Operating Systems, Language Development or Software Tools. The positions can be on a permanent or two-year contract basis, with relocation expenses paid. This is a demanding position that will give excellent career advancement in a varied and interesting environment.
Ref: 498/CW/Clive Wright

Holland
£10,000-£16,000

Our client is looking for an IMS specialist to work in the Hague area. The successful person will advise the company on the definition and implementation of new applications based on their IMS database system. You will be dealing with senior management, so effective communicating skills, both written and verbal, are required. This is a permanent post with an excellent salary and benefits package which includes a company car.
Ref: 498/CW/Clive Wright

Oxfordshire
£4,500-£7,000

Software Designers and Programmers are required for mini and micro software development projects. Previous experience on DEC, HP, DG, FERRANTI, GEC, INTEL, TI, MOTOROLA, etc., hardware would be of particular interest. A minimum of 18 months' experience is required. Opportunity exists for travel in both the UK and abroad. Projects include Basic and Applications software for commercial, technical, military and industrial/Process control applications.
Ref: 380/CW/Roger Allington

London
£6,000-£9,000

Communications and Basic Software specialists are required by this leading international Consultancy for a number of new projects based on mini and micro hardware. Previous software experience on mainframe or mini hardware would be of interest at both design and programming levels. Specific experience could include OPERATING SYSTEMS, COMPILERS, COMMUNICATION SOFTWARE, MESSAGE SWITCHING, DATABASE SYSTEMS, etc. Long-term prospects are excellent together with opportunity for overseas travel.
Ref: 310/CW/Roger Allington

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356, or write to the above address.

If it would be more convenient to telephone in the evening, or weekend, the telephone numbers are: Roger Allington — Berkhamsted (04427) 2289, Renee Nute — 01-874 6372, Clive Wright — East Grinstead (0342) 22270, Marian Tabone — 01-568 5568.

Members of Computing Services Association

V. A. HOWE & CO. LTD.

2 ANALYSTS/ PROGRAMMERS

We are looking for young programmers with knowledge of Honeywell Cobol to join our small systems team. At present we are in the latter stages of conversion from a Honeywell 61 to a Honeywell 62/40 having 224K memory and 8 on-line terminals.

The work will be varied and interesting as we not only service the parent company's O.P. requirements, but also plan to make significant moves into the B2 bureau market.

The starting salary will be negotiable according to experience.

The future rewards will be very good for people prepared to work hard and make a significant contribution to the company.

Applications in writing to:

Mr. A. Dolton, D.P. Controller
V. A. Howe & Co. Ltd.
38 Peterborough Road
London SW6 3EP

UNIVERSITY OF EDINBURGH
DEPARTMENT OF ARTIFICIAL INTELLIGENCE

SYSTEMS PROGRAMMER

(RESEARCH ASSOCIATE)

A systems programmer (research associate) required to join a research team which is investigating how children's mathematical skills are altered through using programming as a method of exploring mathematical processes. Duties will include implementing LOGO, a non-numerical programming language as a DEC LSI-11 machine and developing systems software for other types of microprocessors, and writing applications packages for use by school-children. Applicants should have a degree in Computer Science or an equivalent qualification. Previous experience with DEC POP-11 computers and a working knowledge of ASSEMBLER would be an advantage. The post is available for three years. Salary will be at an appropriate point on the IA scale, £3983-£5194, according to age, qualifications and experience. Further particulars may be obtained from: Dr. HOWE, Department of Artificial Intelligence, University of Edinburgh, Forrest Hill, Forrest Road, EDINBURGH EH1 2QL, with whom applications, together with the names and addresses of two referees, should be lodged not later than 21 October, 1978. Please quote reference 8042.

PLAN

SYSTEM PROGRAMMER
c. £5,000

THE JOB: Maintaining and developing a DOS/VS system with POWER/VS, SHADOW 11T.P., on line SHADOW/QUOTA, PL/1, and RPG11. Also some application programming.
This successful applicant will be responsible directly to the Chief Programmer.
THE INSTALLATION: A 256K IBM370/125 with 3330 disks, tape and V.D.U.s.
REQUIREMENTS: Experience in system generation and maintenance, plus some assembler. Also, an ability to work under minimum supervision with maximum initiative.
Experience in Shadow 11, PL/1 or RPG11 would be an advantage.
THE COMPANY: Is a first-class employer and offers excellent conditions of service. Re-location expenses will be paid where appropriate.

Please write briefly setting out experience to:
A. Sampson, Company Personnel Manager
E. Gomme Limited, Spring Gardens
High Wycombe, Bucks.

OPERATORS & PROGRAMMERS

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Outstanding opportunities exist for Recruitment Consultants with a background in DP. It is a fast moving environment offering benefits geared to energetic people

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One year's experience in any multiprogramming installation. Sponsored training. Excellent industrial environment. Good prospects. Ref 267

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Two years experience, preferably in an NCR Century environment with a yen to steal for this West End job. Excellent perks and prospects. Ref 446

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One year's experience will get you this job, based in S.E. London. Real time system and excellent perks and prospects. Ref 351

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ANALYST/PROGRAMMERS
(6 posts) Post Ref. ES 19

AP3/SO2 — £3732-£6060 inclusive of supplement

The Directorate has its own computer group and uses half the capacity of the County IBM 370/158 (VM370 + CMS, OS/VS1 + CICS). About 30 terminals and 4 remote sites on the computer power while a Celcomp 7000 plotter, Ferranti digitiser and two Tektronix displays provide graphics.
The group needs engineering, mathematical and computer science graduates to write cost-effective programs for highways, structures, traffic, transportation, planning and engineering management. Interactive programming in APL and CICS experience are highly valued and a professional computing with Fortran or Cobol is essential. Successful applicants pursuing professional qualifications for accelerated progress to the senior officer scale (£6,222 plus supplement).
Application forms and further details may be obtained from Directorate of Planning, Engineering and Transportation, Room 238, County Hall, Wakefield, and returned by October 18th, 1978.

FOR OPPORTUNITIES IN MINI AND MICRO SYSTEMS

SYSTEMS DESIGNERS LIMITED

Visit our new Head Office at PEMBROKE BROADWAY, CAMBERLEY on Tuesday, 3rd October

Continued expansion of Systems Designers Limited has resulted in the acquisition of additional premises in Camberley, Surrey, to form a new head office and to house the Systems Division. The company's Products Division will remain nearby in the Frimley offices.

Systems Designers Limited is a professional organisation having total systems and software capability. To help meet the continuing high demands placed on these services, a considerable number of professional staff are required at programming and engineering levels.

We are therefore holding informal interviews in our new offices in Pembroke Broadway, Camberley, on 3rd October, from 17.00 to 21.00 hours. We will be pleased to welcome anyone interested in learning more about our company and the rewarding careers offered.

If you can meet the challenge of intellectually stimulating and varied work with a leading, well-established software and systems consultancy specialising in mini and micro computer real-time applications, then please drop in for a drink and a chat with our managers and consultants. The office is adjacent to Camberley Railway Station.

If you cannot make it, telephone Bill Hockey, our Operations Director, on Camberley (0276) 62244, or write to him at:

SYSTEMS DESIGNERS LIMITED
Systems House
1 Pembroke Broadway
Camberley, Surrey GU15 3XH

Current growth areas of the Systems Division include:

Communications — Emulators, Message Switching, Telex Systems, Communications Management Systems, Computer Communications.

Industrial — Process Control and Monitoring, Plant Control, Simulation, High Speed Data Analysis.

Military — Modelling, Avionics and Radar Systems, Complex Rigs, Simulators, Microprocessor Missile Systems.

Systems Designers Limited require:

Graduates — **from £3,500**
Your education has given you a good academic training. Systems Designers Limited will use this to provide you with a wide practical computing experience. If you have a degree or expect to qualify shortly in a numerate discipline, then contact us to discuss your opportunities.

Programmers — **up to £5,000**
Programmers are required with about two years' experience. As a leading company in minicomputer and microprocessor systems, Systems Designers Limited can provide you with a wide variety of experience in the technical computing field.

Software Engineers — **up to £7,500**
Systems Designers Limited require software systems engineers with experience in Communications, Industrial or Military systems. We can provide you with a rewarding career at the forefront of technology.

NEW ICL 2960 INSTALLATION
SWINDON, WILTSHIRE

Programmers

c. £6,000, plus tangible benefits including significant purchasing discounts

Our client, a major British group with a unique record at home and in exports, is centralising its DP service division in Swindon, Wiltshire, in brand new, purpose-built premises based on a central large scale ICL 2980 main frame under VME/B feeding a network of mini's and micros. To meet wide-ranging long-term development plans, the DP Services Division wishes to recruit two self motivated programming professionals. Where appropriate, comprehensive training will be provided.

These are ground floor opportunities for people with the right experience and aptitude, to develop worthwhile and rewarding careers in DP and the company is geared to a comprehensive staff development and training programme, where people with obvious talent are given every opportunity to progress. The client is able to offer good starting salaries and unique benefits, including significant discounts over the whole range of the group's merchandise, to successful candidates and an excellent relocation package.

You possess at least 18 months COBOL programming experience and are keen to move into DP environment where the management is progressive and enlightened, and where you will be involved in designing and implementing systems using advanced DP techniques. These appointments offer an opportunity to work at the front end of technology and business, and to sharpen your future career prospects.

TO APPLY
Applicants, male or female, are invited to send a ONE PAGE NOTE (handwritten) covering the following brief details: name, address, age, office and home telephone numbers, programming experience to date, relevant hardware experience, previous employers and positions held, present employer and position and salary to ANTHONY SPURR, Management Recruitment Division, quoting reference number G652, at the address below. Please list on the reverse side of your application those companies to which you would not wish your application to be short listed.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01 633 0866

BIS Applied Systems

Metropolitan Borough of Wigan

WIGAN COLLEGE OF TECHNOLOGY

Applications are invited for the following post in this recently designated tertiary College.

LECTURER GRADE II IN COMPUTING

Applications are invited for this post to take effect from 1 January, 1979.

Candidates should have experience at POP8 machines and must be prepared to accept the organising responsibility for certain courses and computer services as well as provide lectures on Computer Science and Data Processing.

Industrial experience and the ability to contribute lectures in Operational Research will be an advantage.

Salary Lecturer Grade II in the range of £4,101-£8,556.

Further particulars and application forms from the Chief Administrative Officer, Wigan College of Technology, Parson's Walk, Wigan WN1 1RR to be returned within 14 days of this advertisement.

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JIM FORT on 01-402 9366
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MYRIAD APPOINTMENTS LIMITED
Computer Personnel Consultants

SYSTEMS ANALYST

NORTH LONDON — **PACKAGE c£6000**

Our client is a well known engineering contractor, successfully carrying out construction work on many large capital projects in both the United Kingdom and throughout the world.

At present an IBM 370/125, shortly to be upgraded to a 370/138, serves the group systems from their management services division. Major development plans include the addition of IBM System 34 computers to be located at strategic points throughout the country. These will serve regional centres in a satellite function and also operate as front-end processors to the main configuration.

An excellent opportunity exists for an experience Systems Analyst to join an energetic team committed to this exciting development which includes the use of a DATABASE (DL/1).

The successful candidate will be responsible for project development from feasibility study and system proposal through to successful implementation. It is expected that the person appointed will have at least two years systems experience and will have had a programming background in either COBOL or RPG II.

The company are very conscious of good employee relations and provide an extensive range of benefits to attract and retain first-class professionals.

Ref. N1/2809

24-hour answering service.
Please telephone for a confidential discussion or write to:
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01-353 0981

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As demands for these services continue to increase they require more professional staff with knowledge of process control, communications, military and diagnostic software. Experience with an Assembly Language and either Coral or RTL/2 is essential. Also required is a familiarity with a real-time operating system and general computing applications in industry.

In addition to basic salary Gemini offers a substantial profit related annual bonus, free life, health and accident insurance schemes, a minimum of four weeks' annual holiday plus generous allowances while working on clients' sites in the UK and Europe. Relocation assistance will be offered where appropriate.

Please phone or write to Ray Waston at the address shown below.

Gemini Computer Systems Ltd.
Industrial Systems Division
Roberts House, 80 Manchester Road
Altrincham WA14 4PL Tel 061-941 1922

GEMINI Recruitment

BOROUGH OF PRESTON

Programmer/Analysts

AP2/3/4/5
£3,278 to £5,073

Borough Treasurer's Department
Applications are invited for two posts of Programmer/Analyst in the Computer Section of the Borough Treasurer's Department.

The Council computer is an ICL 2903 which is already processing many financial systems. A Corporate Development Plan has recently been approved and the above new posts have been created to further its implementation.

Applicants should possess at least three years' COBOL programming experience. Familiarity with ICL Software and some Systems Analysis experience would also be desirable. The commencing salary will be related to the successful applicant's experience and qualifications.

Temporary housing is available and furniture removal costs are paid in appropriate cases. Closing date 12th October 1978.

Application forms are obtainable from and returnable to the Assistant Executive Officer, Town Hall, Preston PR1 2RL (Tel. Preston 54881, Ext. 371).

SYSTEMS ANALYST

Due to the significant expansion of the Company's manufacturing facilities at Seal Sands, Teesside, the Company require to recruit another Systems Analyst.

The successful applicant will form part of a small group and will be involved initially in the design and implementation of a Materials Management Project.

Candidates should be fully conversant with Fortran and Assembler programming and must have at least 2 years' experience of on-line systems design and programming and have worked in a mini computer environment. Previous experience in inventory computing within the process industries would be an advantage.

The Company offers an excellent salary together with first-class conditions, including non-contributory pension and life assurance schemes. Please write giving brief details of qualifications and career to date to

Recruitment and Training Supervisor, MONSANTO LIMITED, Seal Sands, P.O. Box 62, Middlesbrough, Cleveland TS2 1TX. Tel. Seal Sands 546464.

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E.D.P. SUPERVISOR

CRAWLEY, SUSSEX

Are you fully experienced in all aspects of operations within a small mainframe environment including supervision and day-to-day control of data?

Langley, a medium-sized, well-established company, require for their head office in Crawley, a person suitable to take control of a small installation. The job will involve supervision of operators, training of staff, data security and implementation of development work.

Cobol and R.P.G. experience advantageous but not essential, training possible.

A realistic salary is offered including excellent prospects for advancement as the E.D.P. Department develops, good working conditions, pension scheme and sports and social club are part of the benefits. For application form telephone or write to:

Personnel Manager
LANGLEY LONDON LIMITED
Manor Royal, Crawley, Sussex RH10 2PL
Tel: 0293 29091

NEW ZEALAND
Christchurch
ANALYSTS AND PROGRAMMERS

THE COMPANY one of New Zealand's major manufacturing organisations in the garment and textile industry. Their head office is situated in Christchurch. They have branches sales offices and manufacturing units throughout New Zealand with associated offices in Australia and the United States.

THE INSTALLATION — Situated in the centre of Christchurch, currently operating an ICL 1903T with EDS 60 and on-line data entry, planning for conversion to 2900 now being undertaken.

VACANCIES — they require experienced analysts and programmers to join their development team.

Qualifications — applicants must have — a proven record of achievement in implementing major systems.

A professional approach in the art of client liaison.

Previous ICL 1900 experience desirable — 2900 experience would also be an advantage.

Ability and personality to work in a team environment.

REWARDS AND BENEFITS — excellent commencing salaries — commensurate with applicant's expertise and ability. Assistance with relocation expenses to New Zealand, and assistance with accommodation on arrival. Staff superannuation scheme after qualifying period.

Our client will be visiting the United Kingdom for the purpose of interviewing prospective applicants during the last two weeks in September, 1978. In the first instance, please contact our associates

Chad Stolper, Prospect Computers Limited, 6 Bloomsbury Square, London, WC1. Telephone: 01-242 2142.

I.D.P.E. PERSONNEL SERVICES LIMITED
P.O. Box 1667, Auckland 1, New Zealand
(Offices in Wellington and Christchurch)

Personnel Consultants to the New Zealand E.D.P. Industry.

UNIVERSITY OF ABERDEEN — COMPUTER OPERATOR

required for Data Processing Section, University Office, Regent Walk, for duties in connection with the recently installed C.T.L. Computer. Applicants must have had previous operating experience. For suitable candidate salary on scale £2647 to £3389 per annum, with appropriate placing. Scale currently under review. Appointment will in future involve 2-shift working for which a salary supplement will be paid. Application forms may be obtained from the Secretary, University Office, Regent Walk, Aberdeen AB9 1FX, to whom completed forms should be returned by 9 October and quote Ref. No. 172/78.

If you are interested in starting an employment agency (London area) I would like to hear from you.

Computer Weekly
Box No. 1983
Dorset House
Stamford Street
London SE1 9LU

COMPUTER PROGRAMMER

with around 2 years' experience required for our P.D.P. 11-40 using basic language. This would suit someone hoping to advance into Systems Analyst post in the near future.

We would prefer someone with R.S.T.S. experience. Salary £4,000-£6,000 depending on experience.

Please contact:

Marilyn Parker
Personnel Department
RIPOLIN LIMITED
Balfour Road
Southall, Middx.
Tel: 01-574 4363

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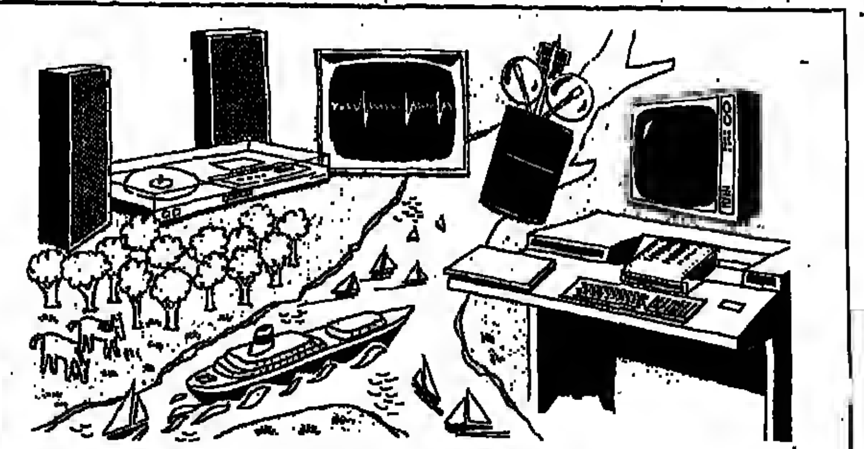

Scientific Computing in
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Mullard Southampton is a leader in the dynamic world of the silicon chip; we design, develop and manufacture MOS integrated circuits.

One of our key areas is the **Computer Aided Design** activity which provides a support to our electrical development engineers.

We now offer you the opportunity to join us at the forefront of the micro-electronics world — we need someone (male or female) with programming knowledge and experience in a scientific application, preferably Fortran or Algol, to join our CAD team. The work is varied – ranging from creating systems to programming on a dedicated computer – a 128K word SEL 32/56 computer with Tektronix graphics.

You will probably have a degree in a relevant scientific subject with an appreciation of electronics and be able to demonstrate to us a practical aptitude in using computers.

Salary will depend on the experience you can offer us and there are excellent fringe benefits, including generous relocation expenses where necessary.

Our Southampton plant is situated on the edge of the New Forest and is close to the Solent with its attractive water sports facilities.

Please write with details of your qualifications, experience and current salary to: Lucy Ward Dyer, Personnel Officer, Mullard Southampton, Millbrook Industrial Estate, Southampton SO9 7BH. Or telephone Southampton (0703) 775533.

Mullard Southampton

COMPUTER ENGINEERS

FOR THE WEST COUNTRY

Western Accounting Systems — A rapidly expanding computer sales company require experienced field service engineers able to repair to chip level and maintain their range of Disc based Mini Computers at customers installations around the West Country. If you feel that you have the sort of experience which we are looking for then please contact either Richard George or Roger Ford on 0934 415398 or write to:

WESTERN ACCOUNTING SYSTEMS LTD
4 Walliscote Road
Weston-super-Mare, Avon

Technical Programmer

LONDON SE1

The Computing Branch provides general computing services and facilities to administrative departments, research staff, and power stations in South East England.

A Technical Programmer is required for work on mini computers used in power stations and by research staff for monitoring plant and collecting data. At least one year's practical experience in programming for PDP11 or similar computer, preferably on real-time systems.

Salary within a scale rising from £4194 to £6735 per annum according to qualifications and experience.

The minimum qualification for this post is 'A' level mathematics, and a degree or professional qualification would be preferred. Appropriate subjects would be computing science, mathematics, physics, economics, electrical/electronic engineering.

Applications quoting Vacancy Number 390/78/... giving full details should be forwarded to the Personnel Officer (Recruitment), Central Electricity Generating Board, Bankside House, Sumner Street, London SE1 9JU by 5 October 1978.

South Eastern

informatix CONSULTANTS

Haven (Computer Services) Ltd. is the London headquarters of a well-established international Software House Network. To fulfil their planned growth requirements, applications are invited for the following posts:

2 ANALYSTS — 1 MAINFRAME, 1 MINI £5,500 - £7,500

Both should have a minimum of 4 years' experience in D.P. with at least 1 year in Systems Analysis. In addition, the Mini Analyst should have 2 years' experience in designing systems for Minis.

The successful candidates will have worked on at least two of the following applications: Stock Control, Sales Ledger, Purchase Ledger, Nominal Ledger, Payroll and Invoicing. The Mini Analyst will also have some background in Real-time. He will find that experience of packages of the above applications an advantage.

On-Line/Database experience is preferred for the Mainframe Analyst.

Ref. 39/1

TRAINEE/JUNIOR PROGRAMMERS

£3,000-£4,500

Vacancies exist for keen, ambitious trainee/junior programmers. Applicants should be graduates in Computing Science, commercial school trained or TOPS students.

Alternatively, up to 1 year's programming experience, preferably in a commercial environment, is required.

Ref. 39/2

PROJECT LEADER

£6,000-£8,000

This post offers wide opportunities for a responsible and enthusiastic candidate with at least 5 years' D.P. experience in analysis and programming. Some project control/leadership experience, as well as a sound background in general commercial systems is essential.

Previous experience in a Software House environment would also be useful.

Ref. 39/3

MINI & IBM/ICL MAINFRAME PROGRAMMERS £4,000-£6,500

Successful candidates will have at least 2 years' programming background in General Commercial Systems. Mini Programmers will have a minimum of 1 year's Mini experience.

The Mainframe Programmers will have a knowledge of COBOL. A second language, plus On-line/Database experience, will be an asset. The Mini Programmers will ideally have a knowledge of Basic or Fortran or COBOL, and some Real-time experience.

Ref. 39/4

These positions are permanent and candidates seeking long-term career advancement will find considerable scope and prospects within this progressive company. Flexible working hours and excellent fringe benefits are added attractions.

Interviews will be held in London throughout October and offers will be made to successful candidates within 1 week of interview.

Telephone 01-831 6056

informatix CONSULTANTS

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MVS-3031

Now is your opportunity to move forward with the times into the MVS environment.

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Operators up to £4,800

All candidates must have experience operating large IBM mainframes under OS, for a minimum of one year.

Salary and job prospects are excellent within our expanding Systems Department, with opportunities for career progression either in computer operations or programming and systems development.

The company offers a non-contributory pension scheme and subsidised staff restaurant as part of the benefits package. Rented housing may also be available.

AVIS ARE ABLE TO OFFER A UNIQUE OPPORTUNITY FOR THE SUCCESSFUL CANDIDATES TO BECOME ACTIVELY INVOLVED IN THE PRE INSTALLATION PLANNING OF THE 3031 WHICH WILL BE OPERATIONAL IN DECEMBER 1978. THESE POSITIONS MUST BE FILLED NOW, SO ACT QUICKLY.

Avis House is situated within easy access of the M3 and M4 Motorways and is convenient to Bracknell Railway Station on the Reading to Waterloo line.

For an application form or further details please write or telephone Colin White, Computer Operations Manager, Avis House, Station Road, Bracknell, Berkshire RG12 1HZ, telephone Bracknell 26644. Ext 251.

AVIS

Management Services

DEVON AND CORNWALL CONSTABULARY

Applications are invited for the following post at Force Headquarters, Middlemoor, Exeter

SYSTEMS ANALYST/ PROGRAMMER

The salary will be in accordance with the NJC Scale Grade SO. 1 — (£4920-£5256 plus £312 per annum 1978 supplement)

The successful candidate will form part of the Force Computer Project Team of the Research and Development Department. He/she should have at least three years' experience in this work, preferably in real-time systems with a working knowledge of a high level language.

He/she will be required to assist in the evaluation, design and implementation of the proposed distributed processing operational management system under the direction of the Project Manager.

Some initial help with temporary housing may be available.

Application forms together with conditions of service and job description may be obtained from the Chief Constable's Office

Devon and Cornwall Constabulary
Personnel Department
Force Headquarters,
Middlemoor, Exeter
Devon EX2 7HQ

Closing date for completed applications 10th October 1978

UNIVERSITY OF YORK

DEPARTMENT OF COMPUTER SCIENCE

SYSTEMS PROGRAMMER

Applications are invited for a post as Systems Programmer. The Computing Service operates a DECsystem-10 and provides interactive and batch computing facilities for the University. A Systems Programmer is required to join the existing group, which is working on support of the Tops-10 operating system together with a variety of projects, including development of a DECsystem-10 to X25 network link. Candidates should possess a degree or equivalent qualification plus relevant experience.

Salary on scale IA, £3,885-£6,666 (under review)

JUNIOR PROGRAMMER

A junior programmer is required to assist the above group. Candidates should have some experience of computing.

Salary on scale IB, £3,384-£5,804 (under review)

Six copies of applications (one only from overseas candidates), naming three referees, should be sent by Friday 13 October to the Registrar, University of York, Heslington, York, YO1 5DD from whom further details may be obtained. Please quote reference number 13/6066 for Systems Programmer or 13/6068 for Junior Programmer.

Senior Operators

To

£5000

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Staggered Day-Shift **and other benefits**

Our clients, a leading Iranian Bank with world-wide activity, are undertaking a program of expansion of their UK operation. Their plans include the installation of sophisticated medium-range Honeywell equipment providing on-line network and batch facilities to their branches in the UK, linking to Europe in the future.

As a result, they are seeking three Senior Operators of high calibre and potential to supervise the smooth running of operations; working on a staggered-day basis, the successful candidates will have responsibility for the efficient scheduling and throughput of work to tight deadlines, technical and operations software support, on-line and off-line job control and training and supervision of junior staff.

Candidates must have at least 2 years operations experience in a multi-stream, teleprocessing environment. Experience of Honeywell GCOS or equivalent, and of staff supervision, would be preferred.

These positions represent excellent opportunities for ambitious operations staff to increase their knowledge of both software control and computer room management, with the obvious career advancement inherent in a rapidly growing installation.

Our client offers an excellent banking benefit package, including a low cost mortgage.

Contact Peter Williamson quoting Ref. 1493.

Lloyd Chapman Associates

123, New Bond Street London W1Y 0HR 01-408 1670

Next week Yorkshire will be in London

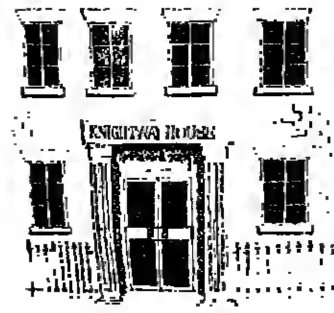
We are Yorkshire Imperial Metals Limited and next Thursday we want to meet you in the centre of London at the London Interviewing Centre, Knightway House, 20, Soho Square, London W1, on the 5th October.

We'll be there any time between 10am and 8pm, so just come in and find why we have so much to offer.

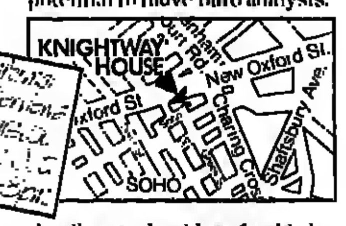
We have recently changed our hardware to a 370/148 running under OS/VS1 and supporting CICS and DL/1 and currently need the following people.

SYSTEMS ANALYSTS
With around 5/6 years experience and a detailed knowledge of hardware and software to investigate new techniques.

SENIOR PROGRAMMERS
With around 4/5 years experience and a thorough knowledge of programming to handle large and sophisticated programme suites.



SYSTEMS DESIGNERS
With about 3 years D.P. experience to develop system and programming specs and with potential to move onto analysis.



Applicants should preferably be graduates or have a relevant professional qualification.

We can offer salaries of around £5K–£6½K, many benefits and exceptional prospects within the company, part of a major British Group. We will also give generous relocation expenses.

Spare a few minutes next Thursday and call in. If you can't make it, phone us on Leeds (0532) 701107, Ext. 424, or write to Senior Appointments Officer, Yorkshire Imperial Metals Limited, P.O. Box 166, Leeds, LS1 1RD.

YORKSHIRE IMPERIAL

IMI

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Programmers, Designers and Consultants Belgium & Berkshire

Salaries: to £16K (Belgium) to £9K (U.K.)

An internationally renowned supplier of Data-Base and Teleprocessing Management Systems has retained Logistix to identify top calibre Data-Base and Teleprocessing
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* SOFTWARE PROGRAMMERS
* SYSTEMS ANALYSTS
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for its Belgian Head Office and U.K. Regional operations.

THE COMPANY. Our client has its Corporate Head-Quarters in Ohio, U.S.A. having installed its first product in 1968. To-day its operations are world-wide including Canada, Europe, South America, Far East and Australia. Since its inception the Company has successfully served over 200 clients installing on-line and data-base applications, whilst the number of installed products exceeds 5,000. Currently, the Company's head-count exceeds 600 world-wide with a sales turnover of $50 million per annum.

THE PROJECTS. Some of the Company's recent projects have included the following:—
* Development of Data Base and Real Time Systems and Programming Standards.
* Data Base Production Control Systems.
* Turn-key applications and systems software package development.
* Conversion of other DB/DC software.
* Implementation of warehousing distribution systems.

THE PEOPLE. These very important positions will appeal to those who wish to live overseas in a multi-language society (French/Dutch/English), or to those who wish to improve their knowledge of French or Dutch (whilst at a later date there may be a limited number of positions available in Frankfurt). Whilst for those who prefer to remain in the U.K. you will have an outstanding opportunity to live and work in one of the most picturesque areas of the Thames Valley. Even then there will be ample opportunity for travel within the U.K. and overseas should it be desired.

Technically speaking you must have current experience in the implementation and support of **Data-Base and/or Real-Time systems.** Suitable applicants should therefore offer in-depth **IMS DB/DC** exposure or similar Data-Base experience with an independent suppliers' software.

Our clients are seeking:—

* **APPLICATIONS/SYSTEMS PROGRAMMERS** with a minimum of 18 months programming experience in COBOL, PL/1 or BAL in a commercial, financial or manufacturing environment.
* **SYSTEMS DESIGNERS/ANALYSTS** who must have worked in the capacity of either Project Leader or Project Manager and have been involved in a feasibility study, the design and subsequent implementation of at least one complete system preferably in the areas of sales ordering, stock/inventory control, budgeting/forecasting, foreign exchange/investment and portfolio management.
* **CONSULTANTS** who must demonstrate multi-hardware and software expertise with either a Manufacturer or Systems House. Particular reference will be paid to those who are expert in the areas of Project Planning, System Analysis and Design, "Top-Down" Development and Structured Programming techniques.

THE BENEFITS. The higher than average salaries reflect the prominence which our client places in the acquisition of these key personnel. Additionally, extensive benefits include full re-location expenses, life and disability insurance, pension and medical plans, overseas allowances and liberal mileage allowances.

FOREIGN ASSIGNMENTS: you will be offered similar terms to the U.K. positions with the additional benefits of "all found" accommodation for both yourself and your family. Where necessary financial assistance towards the cost of French language courses will be given. Willingness to relocate for a meaningfully extended period is therefore a prime criteria in applying for such positions.

THE INTERVIEWS. In the first instance we will conduct initial interviews in our London office, after which candidates will be short listed to meet two of the Company's senior management who will visit our offices in mid October. Offers of employment will be made no later than seven days after interview. It is hoped that for both U.K. and Belgian positions appointments will be taken up in November. Please contact **John Staley.**

Ref: 27/A

Logistix, Freepost 32, London W1E 3YZ
01-491 4636 **Telex 28800**
(Reverse charges)

LOGISTIX

Avon House, 366 Oxford Street, London W1N 9HA

ACP/PARS/IPARS and ALC, BAL Technicians

Informatics Inc., the International Computer Consulting firm, will have numerous openings in the near future for qualified programmers and analysts to work with its client, a major U.S. Airline, developing airline applications in the UNITED STATES during the next 12 to 18 months.

Candidates with previous experience in ACP/PARS/IPARS, as well as ALC and BAL programs, both with and without prior airline experience can qualify.

These positions entail a minimum 12–18-month stay in the Western United States enjoying excellent salaries, generous relocation allowances (and including fully-paid return fares), time off to tour the U.S., participation in many Informatics benefit programs, and a priority reassignment to our London Office for the successful performer.

Expense Paid Interviews in London and Manchester, October 2 through October 5.

To arrange a confidential local interview in London or Manchester, send résumé immediately or phone Miss Angela Nenni at our London Office beginning Friday, September 29 (reverse charges accepted).

Informatics Inc — Africa House, 64-78 Kingsway, London WC2B 6AL, 01-405 8648

Computer staff required by NALGO

Computer Manager

Applicants must have ability to develop and control a computer section. Salary £7053-£7784 per annum, plus £435 London weighting allowance.

Data Processing Manager (Systems/Programmes)

Applicants should have two years' in-depth system analysis experience and ability to communicate effectively with user departments. Must be self-motivated.
Salary £8188-£8887 p.a. plus £435 London weighting allowance.

Three Programmers

Applicants should have two years' Cobol experience on ICL 1900/2904. Salary £5238-£6086 p.a. plus £435 London weighting allowance.
To work on ICL 2904 (40K, Tapes, EDS 50s, and D.O.E.s).

Applications include financial, insurance and assurance, building society, salaries, wages, etc.
26 days' annual leave for these posts and additional leave at public holidays.
Partial mortgage interest rebate. Contributory pension scheme. Staff restaurant.
Requests for application forms and further information should be sent to The General Secretary, National and Local Government Officers Association, 1 Mabledon Place, London WC1H 9AJ. (Telephone 01-388 2358 Extension 318).
Closing date for receiving completed application forms 13th October, 1978.

SYSTEMS ANALYSTS

PERMANENT OR CONTRACT from MID OCTOBER to work with existing project teams involved in SYSTEMS DEVELOPMENT for clients in the WEST COUNTRY and CENTRAL LONDON. Experience of Life Assurance or retail distribution systems advantageous but not essential.

For details contact Bob Carr or Ian Gold.

Fraser Williams (London) Ltd., 38 Warren Street, London, W1. Tel. 01-388 0038.

Fraser Williams computer consultants

Computer Operations Manager

Salary up to £6,627 (incl.)

Computer operations management experience is required for this important and interesting career progression post in the forward looking computer environment in the Borough Treasurer's computer installation situated at Bromley Town Hall.

Suitable applicants (men or women) will possess at least five years' operations experience on ICL 1900 equipment, of which should have been in operations management. Candidates will be in their late twenties/early thirties, management and leadership skills and the ability to motivate a staff of twentyfour. This should be coupled with knowledge of the George 3 Operating System. Apart from day-to-day responsibility for all operational control functions the postholder will be expected to contribute to management team discussions leading to the formulation of computer policy and selection of equipment, etc.

The INSTALLATION consists of an ICL 1903T computer with 96K core being increased to 128K shortly, with EDS 60's and Track Magnetic Tapes supporting an on-line VDU and network under the George 3 Operating System during prime shift and Batch processing at other times. Data preparation is Key to Disc linked by a remote communication link direct to the operating system.

The leave entitlement is 26 days + 3 days after 10 years continuous local government service. In approved cases assistance will be given towards reasonable removal and resettlement expenses. Closing date 12th October 1978.

Application forms from Assistant Chief Executive (Manpower), Town Hall, Bromley BR1 1SB. Tel: 01-464 3333 Ext. 3318.

London Borough of Bromley

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

PROGRAMMER

SOFTWARE AND APPLICATIONS

FELTHAM **To £4500**

A major corporation with substantial interests in industry and banking has a computer centre in Feltham providing DP facilities for all industrial companies within the group.

The Industrial Division consists of companies involved in Manufacturing, Distribution and Commercial Services. The demands placed upon the computer centre, therefore, are for a diverse range of systems, and several user organisations have established communications links with the central mainframe.

To meet the increasing development demands being placed upon existing resources a programmer is required to join a small team in which he/she will have the opportunity to work in both systems programming and applications areas. A minimum of twelve months COBOL experience is asked for, and knowledge of Filetab, whilst not essential, would be advantageous.

Installed hardware comprises an ICL 1903T running under George II+ and MAXIMOP.

This position is an excellent opportunity for an enthusiastic person to substantially broaden their experience, working in an active environment. The starting salary is supported by fringe benefits including a non-contributory pension scheme and assisted BUPA.

Ref. W3/2809

24-hr. answering service
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Ring Ian Carter for further details on 01-261 8016.

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CHIEF EXECUTIVE'S DEPARTMENT

COMPUTER OPERATIONS

Applications are invited from suitably qualified/experienced candidates for the following posts

(a) Shift Supervisor

Ref. CE 298/CW

£5,058-£5,358 (plus shift allowance)

(b) Computer Operator

Ref CE 297/CW

£4,330-£4917 (plus shift allowance)

You should have

Two years' experience (A) or 18 months' experience (B), knowledge of IBM hardware, trained under DOS/OS and power/VS, a good standard of education.

We are offering

Competitive salaries, five weeks' annual holiday, a two-shift system (three for shift supervisors which includes a 9-5 shift), subsidised restaurant, voluntary overtime, latest equipment in software, friendly local environment, sporting facilities

The installation

IBM 370/138 (one half megabyte) 3340 disks and 3420 tapes, DOS/VS power OS, interesting and varied applications, forthcoming upgrades including 3344 disks and tele-processing (local and remote).

For informal discussion contact Dudley Bacon on 01-690 4343 Extension 250.

Application form, returnable by 13th October, 1978, and detailed job description from Chief Personnel Officer, Town Hall, Catford, London SE6 4RU, or telephone 01-690 7886 (24 hour Ansafone service), quoting appropriate reference and job title.

Tell me what you have to offer... ...so that I can offer you...

A challenging and rewarding opportunity to work in a new Computer organisation on exciting new developments, using our Honeywell Level 66 which is to be delivered to us in December. Developments next year will cover Customer Accounting, Financial Accounting, Corporate Planning and a wide range of Technical Systems. Also, as a new organisation we expect extensive project work in the years ahead, making full use of the teleprocessing, database and timesharing techniques afforded by the Level 66, which is likely to have Level 6 mini-computers attached to give distributed data processing facilities.

To meet our development programme we need:-

SYSTEMS ANALYSTS AND PROGRAMMERS

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Your starting salary will be based entirely on the experience package you can offer me, and your future salary progression will be determined by how much additional experience you accumulate with us. Generous relocation expenses can be paid in appropriate circumstances.

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and return to a career position in the U.K.

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Join INFORMATICS INC., a prestigious world-wide consulting company. Initial assignments will be in the United States as part of our programme of Orientation, Training and On-the-Job experience, to develop your technical and management skills for your return to our British operation. We have recently opened a London office and currently have assignments throughout Britain as well as on the Continent and in Asia, thus affording you an excellent career opportunity upon your return.

Excellent salaries and generous relocation allowance including fully-paid return fare.

Expense Paid interviews in London and Manchester, October 2 through October 6.

To arrange a confidential local interview in London or Manchester, send résumé immediately or phone Miss Angela Nanni at our London office, beginning Friday, September 29 (reverse charges accepted).

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LONDON W1V 3HP 01-439 6481 (24 hours)

CW2 28 9 78

Chief Programmer

The A.P.V. Company Ltd.

APV is a major international process engineering group; we are seeking an experienced person to fill this important computer vacancy at our Crawley organisation headquarters.

The computer department services currently include on-line production control information on a DEC 11/70, batch programs for pay, accounts and costing on ICL System 4 equipment, and computer aided design and graphics on a Prime 400. A Prime 500 computer is also on order.

The Chief Programmer will supervise and schedule programming within the 35 strong computer department, and be responsible for establishing and maintaining programming standards and disciplines.

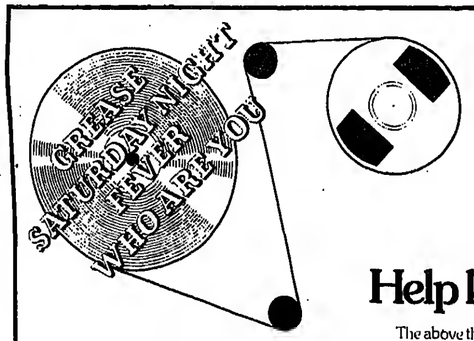
The ideal applicant would have been programming for six to ten years, and would be fully familiar with several languages including COBOL, with experience of controlling both staff and projects.

This post would particularly suit someone from a commercial installation using mainframes, who wishes to broaden their experience of machines and applications and to increase their level of responsibility.

An attractive salary and a possible relocation package is being offered.

For further details of the job, salary and Company, please contact:
The Personnel Department,
THE A.P.V. CO. LTD.,
P.O. Box 4,
Manor Royal,
Crawley,
Sussex
Tel. Crawley 27777.

APV



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Our computer plays a major role in keeping us ahead of the field, therefore we consider our computer staff to be vitally important.

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Analysts Four years' experience is needed here, ideally which has included usage of COBOL, and familiarity with such commercial systems as order processing, accounting, invoicing etc. Salary offered is likely to be around £6,500 + bonus.

Analysts/Programmers 3 years' experience on IBM using COBOL is needed, together with, ideally, a knowledge of CICS. This position may suit a Programmer looking for a move into Systems. Salary offered is likely to be around £5,250 + bonus. We use an IBM 370/145 – 768K with 3330 Disk drives and 3270 VDUs operating under DOSVS and CICS. Systems are being dramatically improved in line with an aggressive expansion programme which will create many internal promotion possibilities.

To find out where you could fit into our team, ring our DP Manager on his home number Chelmsford (0245) 64694 or write to him through our Personnel Department at:

Phonodisc Ltd., Grove Road, Chadwell Heath, Romford, Essex. 01-590 6088

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LONDON, W.1 **Up to £6,200**

Our clients, who have an ICL 2980 installation in the West End, are implementing major database (IDMS) systems and using MAC and TP techniques. This is a chance to join the software team, learn about MVE/B and IDMS, and use your skills on advanced systems in a technically interesting environment.

First-class training will be provided, and working conditions are good (new offices, staff restaurant). Due to volume of development work, career prospects are sound.

This opportunity will interest ambitious programmers who have worked in a software or systems programming role on any hardware, using any language.

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EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

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COMPUTER OPERATOR **£4200-£4500**

in connection with its expanding activities and following a review of its hardware requirements which will lead to the acquisition of two DATA GENERAL configurations employing "Eclipse" series processors.

Whilst the successful candidate, who is likely to be aged between 24 and 30, will not necessarily have had experience in the specific machine environment we detail, operating experience in an on-line and multi-programming environment will be essential to fill the vacancy.

For our part, we can offer the very best in fringe benefit packages plus a commencing salary package in the range £4200/£4500 depending upon previous experience.

Should this opportunity interest you, please apply in writing or by telephone to

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RSGB Limited is a progressive Market Research Company based at Crown House in Morden.

We require a trainee programmer and also a programmer with 2 to 3 years experience to work in our Data Processing Department.

A competitive salary is being offered and the successful candidates will enjoy varied and interesting work.

Please write giving details of qualifications and any relevant experience to:-

Carol Andrew
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SYSTEMS PROGRAMMER to £7,000
A sound experience of DOS/VS operating systems, together with knowledge of POWER, ASSEMBLER and CICS for a banking 370 installation in the City. Ref 304

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SYSTEM 3 OPERATOR to £4,050
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Computing Services Association Agency Licence SE(A) 3345

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W. Midlands

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Haymarket Computing are D.P. recruitment consultants to 35 companies in the Herts/North London area, and we are currently anxious to meet Analysts, Analyst/Programmers and Programmers on behalf of clients located in **Edmonton, Tottenham, Edgware, Waltham Cross, Cockfosters and Watford.**

Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc, so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring

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COMPUTER CORRESPONDENT
for Electronics Weekly

Electronics Weekly, Britain's leading publication for professional electronics engineers and managers, will shortly have a vacancy for a Computer Correspondent as a result of internal promotion. The position calls for someone who combines a good background in computer engineering and applications with writing ability. Experience in journalism is preferred, though not essential, but the successful candidate must be able to produce readable and accurate copy, often under pressure. The scope is extremely wide, including mainframes, minis, peripherals, microprocessors, etc., with the emphasis on hardware rather than software. Plenty of opportunities for travel at home and abroad.

SUB-EDITOR
Electronics Weekly also has a vacancy for a sub-editor, able to undertake copy editing, newspaper page layout, headline writing, proof reading, etc. This position also gives opportunities for some reporting and feature writing.

Both these positions are based in central London and offer attractive salaries. Apply in writing to Peter Woolnough, Editor, Electronics Weekly, Dorset House, Stamford Street, London SE1 9LU.

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Please write indicating any companies in which you have no interest, or phone Paul Scott on 01-262 0181 for an application form.

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RECRUITMENT FEATURE BANKING AND INSURANCE
On October 19 Computer Weekly will be highlighting D.P. Career Opportunities within the Banking and Insurance Sectors.

To advertise in this high readership interest feature contact:

EDDIE FARRELL ON 01-261 8174 or JOHN FARRAR ON 01-261 8097

WELSH HEALTH TECHNICAL SERVICES ORGANISATION
COMPUTER DEPARTMENT
EVALUATION OFFICER
Salary £5,537-£6,715 per annum

Applications are invited from experienced Computer Specialists for this post in the Organisations Computer Department.

The successful candidate will be responsible for the evaluation of new and existing computer applications.

Candidates must be experienced in the evaluation of Computer Systems and Programming Techniques, Operational Research and Statistics.

A knowledge of organisation and methods techniques would be advantageous.

Application form and job description obtainable from:–

**The Personnel Division,
Welsh Health Technical Services Organisation,
Heron House, 35/43 Newport Road, Cardiff CF2 1SB.
Tel: Cardiff 499921. Ext. 18.
Closing Date:- 13th October 1978.**

COMPUTER DEPARTMENT.
Welsh Health Technical Services Organisation
Swyddfa Gwasanaethau Technegol Iechyd Cymru

WHTSO

City of Salford
COMPUTER CENTRE, SWINTON
PROGRAMMERS
£4245-£4632 (A.P.4) including supplements

Applications are invited for two posts in the systems development team at the City Council's Computer Centre where new systems are to be implemented and existing ones maintained on an ICL 1900 Series Computer.

Applicants should have at least 1½ years' programming experience in COBOL, or some similar language, or training will be provided for successful candidates whose experience has been on computers other than ICL 1900. Training will also be provided to equip successful candidates with the necessary knowledge and expertise to enable them to participate fully in the work of the Department.

A working knowledge of PLAN, Communications Processing or TP Software would be a distinct advantage because consideration is now being given to the introduction of processing facilities and future data processing equipment requirements.

Post Reference L620/CW

This post is permanent, superannuable and subject to satisfactory completion of a medical questionnaire. Commencing salary will reflect experience and qualifications. Please write or telephone 061-793 3156 for application form quoting post reference number to the Personnel Manager, Salford Civic Centre, Swinton M27 2BN to whom they should be returned by 13th October 1978.

HEWLETT PACKARD 3000 EXPERT?
Phone Bob Green
01-437 3043.

COMPUTER OPERATOR
We require an experienced Operator for our IBM System model 15 which is to be upgraded to System 34 and [illegible]

Ideally the successful applicant will have sound knowledge of the model 15 or System 34 and an added advantage would be the ability to use OCL. Our hours are 9 am-5 pm Monday to Friday and occasional overtime will be required.

We offer an excellent salary, 4 weeks' holiday, season ticket loan and generous discount on store purchases.

Please telephone for further details:
Personnel Manager, Aquascutum Limited, 100 Regent Street, London W1A 2AQ. Tel: 01-734 6090

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We operate on a friendly and informal basis where rewards are directly proportional to individual effort and ability.

For the next phase of our expansion, we require

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If you have at least one year's COBOL experience, are happy to work on your own and are looking to develop a wide range of skills through real project involvement, then we'd like to meet you.

(If you know Burroughs 880/8800, so much the better)

A-Z

please write to, or ring
graeme cree
a-z computer services limited
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(24 hours)

MERSEYSIDE COUNTY COUNCIL JOINT COMPUTER UNIT
SYSTEMS ADMINISTRATOR
(£4773-£5073 PA INC. SI SUPPLEMENT)

The successful applicant will be responsible for all operational aspects of data communications between the computer unit and on-line branches; monitoring and controlling the daily operation of lines and modems; and act as a link between on-line branches and the service organisation of the terminal manufacturer.

Candidates should have had at least two years' telecommunication experience within a computer environment.

Application forms, returnable by 18th October, 1978 from County Treasurer, P.O. Box 95, Metropolitan House, Old Hall Street, Liverpool L69 3EL

DIGITAL EXPLORATION LIMITED
require a
COMPUTER ENGINEER MANAGER
and
COMPUTER ENGINEERS

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Please contact Sue Wright on East Grinstead 28111.

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Our clients wish to appoint a Data Processing Manager for their European Data Centre in West London. He or she will be responsible to the D.P. Director for Europe for the operations and systems development of an IBM System 3/12 currently developing applications for their Companies in U.K., Holland and Belgium. Future plans include working with an IBM 370 as the international network develops. Opportunities exist for some travel in Europe.

Candidates must have a strong System 3 background, a working knowledge of RPG II and sound experience of commercial and distribution applications.

An excellent salary is offered plus a good benefit package and a pleasant working environment.

Ref. W5/2809

24-hr. answering service
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10K + VOLVO CAR

This Dynamic American Company has opened an office west of London and is looking for 2 young salesmen to spearhead its approach on the U.K. market.

Whilst experience of IBM Mainframe (or PCM equipment) would be a distinct advantage, candidates with a successful sales record in the field would be actively considered.

PHONE NOW—(Humans answer until 8 p.m.)

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To assist in the analysis, design, implementation and maintenance of a wide range of systems. Applicants should ideally have had a basic training in perhaps engineering or accountancy, prior to gaining suitable systems experience.

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To program batch and on-line production, engineering, financial and commercial systems in COBOL using the T.P.S. software for on-line systems.

At least 2-3 years programming/systems experience is required, preferably with I.C.L. machines. Experience of on-line working would be an advantage, but training in the use of T.P.S. software will be given if necessary.

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R. Newton, Personnel Officer Employment,
Brush Switchgear Limited,
PO Box 19, Meadow Lane, Loughborough,
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Tel. Loughborough 63131, Ext. 488.

1976 1977

FOR CLASSIFIED ADVERTISEMENTS IN COMPUTER WEEKLY
Ring Eddie Farrell or Mark Williams on
01-261 8028
01-261 8019

LONDON BOROUGH OF BRENT
PROGRAMMER/ ANALYST
£4017-£4431 inclusive

We have recently installed a Redifon Seacheck Key-to-Disc system which is used for Data Prep and as a mini computer. In order to improve and expand the uses of this equipment we are looking for a programmer with at least 12 months' experience of COBOL and IBM equipment ideally, but this is not essential as training will be given where necessary. The person appointed will be expected to work with the minimum of supervision, and the post will probably be attractive to a programmer who wishes to move into Systems Analysis. At a later date it is envisaged that the work will involve programming connected with our mainframe IBM 370/145.

Generous relocation expenses are available. Interest free-loans for annual rail season tickets, subsidised staff canteen. 35 hour week.

Application forms from the Administration Manager, Room 708, Brent House, High Road, Wembley, Middlesex, returnable 10 October. Telephone 01-903 0371 (24-hour Ansafone service). Reference number must be quoted F/74.

THE SALES BIT
Evaluation and anticipation

IF the day ever comes when my children ask me "Daddy, daddy what shall I do to succeed in the world?" the first thing I will probably suggest is that they avoid the frustration of expecting other people to adhere to the same ethical and moral standards as themselves. Secondly, I will suggest they evaluate and anticipate all things. This, I am sure will give them a perpetual advantage no matter what their chosen vocation, but particularly if they should enter sales and marketing.

I call it "situation evaluation," and while it is intended primarily as a selling discipline, it is equally applicable to all people to people interaction both in business and a social context. It is as applicable to a husband and wife relationship as it is to that between a salesman and a managing director.

The process is simple in conception but potentially complex in application. One might compare it with the process of creating a sculpture where every view, angle and dimension must be considered, the purpose established, the meaning understood, the emotional interaction contained and the cross relationships with external forces anticipated.

It is more than just seeing the other fellow's point of view. It is the analysis of every influence affecting the achievement of an objective. The objective could be anything, closing a sale, getting a bank loan, not buying your wife a fur coat or even making it with the local beauty queen — if you're into that sort of thing!

Many salesmen (from here on also read "people") make the obvious blinkered approach of seeing the selling objective from their own point of view: "I'm selling a good product at a reasonable price so there is no reason for saying no." The smarter salesman views the matter through the eyes of the buyer as well and attempt to evaluate and anticipate his practical, emotional and political motivations and modify their approach accordingly.

Unfortunately, it is seldom as simple as that. There are other forces which can have a profound effect on the decision criteria and are outside the control of the seller and the buyer.

Situation evaluation is the process of taking all these factors into account in order to make a total assault on the achievement of a sales objective.

For example, the salesman is renegotiating a contract with a financial director for the provision of computer bureau services. The company is a medium-sized organisation which is considerably involved in government contract work. The financial director controls all computing and he has the company's brief to handle all negotiation, as indeed he had in the past. The salesman can, therefore, assume he is talking to the right man and that his persuasive skills must be applied in that direction.

Now let us look at a possible peripheral situation and the external influences which are either ignored or unknown to both participants in the negotiation.

- The major internal user department requires new facilities which are being ignored by the financial director and consequently they are exerting considerable pressure on the managing director for authority to use some other bureau which they have personally evaluated and which can satisfy their needs.
- The financial director has handed in his resignation and is joining one of the salesman's main competitors.
- The appropriate government department has threatened to cease the payment of external computer bills and is insisting on the use of a central government computer bureau.
- The most significant of the company's government contracts is coming up for renewal and there is keen competition.
- The financial director wants to install an on-site computer. The managing director does not, particularly, in view of the government contract situation.
- There is general dissatisfaction among internal users related to the service being provided by the accounting department. This has resulted in the formation of a users committee which will have representatives at the board meeting making the final decision.
- The company is part of a large group and the parent is offering to install both batch and interactive terminals and provide machine time at a "knock-down" price.
- IBM has taken the group MD on an overseas visit to one of its manufacturing plants and some appropriate users in an attempt to sell a group data processing solution.
- The financial director is greatly influenced by the opinion of his deputy and his secretary.
- The managing director has been "wined and dined" by a significant competitor despite the fact that he turned down a similar invitation from the salesman's company.
- The salesmen's company is about to sell out to one of its major rivals and also plans to change its supplier of mainframe equipment.

A complex situation perhaps, but even a single unanticipated influence is sufficent to lose a sale. That is why it is essential that the salesman analyses every aspect of the sales situation in terms of all possible logical and illogical influences upon the final decision, even though he may be unable to affect all of the situations he uncovers. His sales manager may be sympathetic because the sale was lost due to "head office interference". But I wouldn't be.

TRADER

Puzzle answer
60,245 + 712,457 + 60,245 = 832,947.

Abraxas Recruitment Division

ABRAXAS West End House, 11 Hills Place, London W1R 1AG 01-439 8891

OPERATIONS

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CITY	OP.	OS/VS1	£4,000
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J/GEN

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If you have at least 8 months' Operating experience on any ICL MACHINES, we may well have a position that will interest you. Conditions of employment are excellent and benefits cover Mortgage Subsidies, Travel Concessions, Free Meals/Restaurant, Annual Bonus plus many more

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HERTS	OPS.	GII	2 YRS+	C £4,000
LONDON	OPS.	GIII	1 YR+	C £3,800
HANTS	SEN. OPS.	1900/2800		C £4,200
HERTS	OPS.	GII	1 YR+	TO £4,000

J/GEN

SHIFT LEADER — C £5,000

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TRAINEE/JUNIOR OPS — C £3,000

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Listed below are some of the vacancies within the Abraxas Operations division. This is a very small collection from a large list of client requirements.

If your particular job is not listed then give MIKE OAKES at ABRAXAS a call and find out about positions that might suit you.

BURROUGHS	MCP/V	S/LDR.	2 YRS.	CITY	£6,000
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UNIVAC	OS 3/4	SNR. OP.	2 YRS.	W. LONDON	£5,000+
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M/GEN

FOR VACANCIES IN YOUR AREA PLEASE RING ABRAXAS NOW

Abraxas Computer Employment Ltd.

Experienced EDP Staff
London

Our client, an international Insurance Company, part of a world-wide group, require additional EDP staff. The company operate an IBM System 3 model 15D using RPG 2. The vacancies are

Project Leader
c. £7,000

Candidates should be capable of leading a small team of programmers/analysts, and have experience of systems analysis and design in the insurance industry. The ability to determine user requirements, prepare and submit reports and liaise with user departments are the other prime requirements of this important position.

Programmers/Programmer Analysts
£4,800-£6,000

The company seeks to extend the existing Programming and systems analysis capability and applications are invited from Programmers/Programmer Analysts with experience of working in the insurance industry. Vacancies exist at both levels and the commencing salaries depend entirely on experience and the contribution anticipated from the successful candidates.

The company has an attractive range of fringe benefits including non-contributory pension, group life and disability insurance. The position offers outstanding opportunities to EDP staff to broaden their experience and work in a sophisticated environment.

Applications to

Houghton Sanderson Associates Ltd.
Executive Search & Recruitment Consultants
Dunster House 37 Mincing Lane London EC3R 7BD
Telephone 01-623 7363/4

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 16 (Rock Around The Block)

Up in the mountains Hex and company are still trapped inside their crater. Time is running out for them, however, because the System now knows where they are.

NIGHT fell as they were trying to find an exit. They worked their way anti-clockwise round the rock face, using Ascii's headlights for illumination. They had never fully explored it, so had some hope of discovering a crack or another tunnel like the one that had led them in. But they were disappointed. The encircling walls were almost sheer, and where they deviated slightly from the vertical it was as likely to be an overhang as a backward slope.

They were about halfway round when they were given an unexpected reminder of what an inhospitable place their former refuge had become. Cleo had just suggested trying to weave a rope, which the others put down by pointing out that the only vegetation was moss, when there was an ominous rumbling behind them. This was quickly followed by a plosive hiss and a violent bang from the middle of the crater, whose shockwave could be felt at the edges. Ascii spun around and the whole party saw, framed in the rays of his headlamps, a towering plume of spray rising from the centre. Then the column of mud and water collapsed, splashing them even where they stood.

It was a geyser. The aerial bombardment carried out in Hex's and Cleo's absence, which had burned down the tree and turned the moss brown, had aggravated a structural weakness in the earth's crust and triggered off a geological chain-reaction. The volcanic crater, quiescent for centuries, had been shaken into renewed activity. This was why the central pond had been growing steadily hotter. There was no predicting where it would end. They were standing on a volcano about to erupt.

Piltdown had paid less attention to this natural phenomenon than the rest of them. He had kept on the search. Now his voice called to them from some distance into the darkness.

"Jen! Mi estas trovinta elvojon."

"What's that about?" asked Zap.

"He says he's found a way out," said Lambda.

They rushed to catch up with him; but what looked like a way out to a Sasquatch didn't look like a way out to a human or to three androids or to a canine machine. What he had re-discovered was his own entrance way — a "chimney" in mountaineering parlance. He had already braced his back against one side and was trying to show them how to sidle upwards.

"Tell him we can't do it," Hex requested Lambda.

"Ni ne povas fari tiele," she said, adding mournfully: "If we had a rope he could take it to the top and lower it to us."

There was no rope, and no material for making one.

"Mi portos vin el la kratero," said Piltdown. "Tio estos tre facila por mi."

"He's offering to carry us out," Lambda told them. "He thinks it will be easy."

Hex got Ascii to shine his lights upwards. The crevice seemed to extend more or less regularly to the lip of the crater, allowing a skilled climber a fair amount of purchase — but one carrying another body? Five times? It wasn't possible.

There was another rumble, and the waterspout shot up a second time. Clearly they had to do the impossible.

"Does he realise he's got to do it six times?" asked Hex of Lambda. "I'm not leaving without the black box."

But the prospect of six trips up the precipice didn't deter him at all, so they decided on an order. The first to go would be Cleo, then Lambda, Zap, Hex, Ascii and finally the box. Hex would have taken it himself — so highly did he now value it — but it was clear he'd need both hands just to hang on while Piltdown ferried him up.

Piltdown wedged himself at the foot of the chimney and Cleo pulled herself on to his ample midriff, clasping her arms round him. "We have lift-off," she declared as the ape started upwards. They kept Ascii's lights trained on the two forms until they lost visual contact about halfway up. For a nail-biting few minutes they saw and heard nothing, but a falling pebble. Then Piltdown reappeared, clambering down on his own at a smart pace. It had taken less time than they had feared.

However, when Piltdown arrived on the ground again, Hex saw there was no cause for elation. The journey had taken more out of him than his lighthearted approach to the task has suggested. He was sweating profusely and drinking the air with long panting gulps. It did not bode well for the later passengers.

Lambda took off next and was soon out of sight. This time the period out of touch seemed, and was, longer. When Piltdown alighted again he was literally soaked in sweat. Hex wanted to ask him to pause and take a breather, but now they had lost their translator.

Zap was next, then Hex. Despite Zap's tallness he was no great load, being uncommonly thin. His lift went without a hitch. It seemed to Hex when Piltdown returned that he had got a second wind. He looked less distressed by the exertion than before. Hex climbed on, grabbed two handfuls of fur, and turned to face the rock.

"Wait for the ape to come back," he told Ascii.

It was embarrassing to stare at the driver in such an intimate mode of transport, but poring over every vein in the cliff face a few centimetres from his nose was very boring. When Hex did look, Piltdown's visage was contorted with strain. Each heave cost him not just effort, but pain. His shoulders were bleeding from friction against the stone. To take his eyes off this suffering Hex, unwisely, looked into space. That was the last he knew of his ride. A wave of vertigo swamped his faculties.

Is this the all-time cliffhanger? Hang on for more suspense.

© Richard Forsyth, Yale Lowe-Sanning

Data Communications Engineer
up to £6,000 p.a.+ car

THE COMPANY
Comshare is one of the top companies in the European computer timesharing industry with an intelligent data communications network which interconnects computer centres in North America and the UK. We also provide local call access from many points in the UK and mainland Europe.

THE JOB
To join a team of professional engineers, based in London, with full responsibility for the day-to-day 24 hour operation of the existing data communications network. A shift/standby system will be operated to provide adequate network engineering support. Activities will include installation and maintenance of network hardware such as mini-computers, multiplexors and modems. Ability to fault-find to component level, especially in respect of mini-computers, is essential. An additional responsibility of the job will involve liaison with the technical staff of suppliers – such as the Post Office.

THE RIGHT PERSON
A highly motivated man or woman with HNC or equivalent in Electronic Engineering and a minimum of two years' solid experience in a data communications environment – or possibly computer engineering. A clean driving licence is essential.

THE REWARDS
Salary, allowances, and car aside, there's an attractive fringe benefit package which includes BUPA and a good pension scheme. Not to mention really excellent career development prospects within this rapidly expanding company.

ANY QUESTIONS?
Then write or phone . . .

Ray Miles, Comshare Limited, P.O. Box 197, London SW3 5RL.
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COMSHARE
MAKING THE COMPUTER MAKE SENSE.

THE COWIE GROUP
have a vacancy for an
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The group will shortly be replacing IBM System 32 with System 34, further enhancement is scheduled during 1979 including additional terminals and real time operation.

We are looking to recruit an analyst/programmer with proven ability to assist in improving current in-house systems together with projected development.

Preference will be given to applicants possessing a sound knowledge of analytical techniques and RPG 11 relevent IBM experience would be helpful.

The salary is negotiable and conditions include use of company car.

Apply in writing to:

Group Accountant
Cowie Group of Companies
Millfield House, Hylton Road
Sunderland Tyne & Wear
SR4 7BA

SUPPORT OFFICER
AP3/4 £4017 to £4917 (including supplement and London Weighting)

Are you a Shift Leader, Senior Operator or Senior Control Clerk with at least 2 years experience of IBM DOS/VS POWER/VS and currently looking for career advancement in a challenging non-shift role? Then you may be interested in joining our young and enthusiastic operating team working in pleasant surroundings at Bexleyheath on a recently installed 1 megabyte IBM 370/138 using DOS/VS POWER/VS and CICS with an extensive communications network and Redifon R300 data entry equipment.

You will be a member of a small team responsible for providing a general operating support service to the installation and its users, involving the set up and control of all new work from the first stages of system development through to live processing, the preparation of operating procedures and customer liaison functions.

For further details or an application form please write or telephone (01-303 7777 Ext. 782), D. Jarvis, Operations Manager, Data Processing Department, 9 Brampton Road, Bexleyheath, Kent DA7 2EZ.

Closing date 6 October 1978

Previous applicants need not re-apply

Bexley London Borough

JOSEPH STOCKS & SONS LTD.
require
COMPUTER SERVICES/SUPERVISOR

North Manchester — Salary: Negotiable with fringe benefits

Joseph Stocks are a major importer and distributor of Danish Bacon and other grocery foodstuffs. The company is situated at Whitefield, North Manchester, with easy access to the M62 motorway.

We require an experienced computer professional to take control of our DIGITAL PDP 11/40 computer operating 10 terminals on line both locally and via the GPO network to a depot in Liverpool.

If you have experience of;
1. Digital Computers using RSTS operating system software
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5. Control of On line and Batch operations
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We can offer:
1. Scope for initiative
2. Management experience
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Any person below the age of 28 or earning less than £4,000 annum would probably not have the relevant experience, otherwise apply in confidence giving full details of age, qualifications and experience to
The Secretary to the Directors
JOSEPH STOCKS & SONS LTD.
57 Stanley Road, Whitefield,
Manchester M25 6OP

WOODSOME PARK ASSOCIATES

is an expanding Computer Bureau situated in its own grounds on the outskirts of Huddersfield. We offer specialised services to the Accountancy profession, Industry and Commerce and as a result of our planned growth, we now have vacancies for the following personnel

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